101 Shihr, and the territory described in the paragraph above might well
131 be accepted as the definition of the term Hadhramaut. Eastwards
from the Hadhramaut succeed the Mahra country stretching on the coast from Museina'a to Ras Dharbat 'Ali, the boundary of the Aden Protectorate, and Dhufar in Oman which is inhabited by the Qara tribes who are a separate people and speak a separate language from the Mahras.

● 133 The Wadi Hadhramaut is the key feature of the geography of the country to which it gives its name. North and south of it the land rises to extensive plateaus which form watersheds. The one to the north, about 3,500 feet above sea-level, has a series of wadis draining north into the sands, and another series draining south into the Wadi Hadhramaut. The watershed to the south, consisting in the same way of plateaus, is higher than that to the north, for it rises to some 6,000 feet. From it, the wadis drain north into the Wadi Hadhramaut and south to the sea. This description is typical of that part of the country through which the wadi runs more or less west to east, that is to say, from about Husn al 'Abr to beyond Tarim. Over this stretch the bed of the wadi falls from a little over 2,000 feet above sea-level to a little under. On the 49th Meridian, a little west of Mukalla, there is an approximate depth of 106 miles of wadi, mountain, and steppe land between the sea and the main wadi, and rather more between that wadi and the desert. As the wadi turns to the south-east, however, it of course modifies these proportions, but the country maintains the same general formation.

Climate.

132 The climate of the Hadhramaut is on the whole healthy. On the high plateaus and even in the wadi land of the interior it is fresh and often cold in winter. In summer it is said to be hot but never unendurable. Mukalla probably enjoys a better summer than Aden. A period of forty days of extreme heat, and consequently known as the Arba'inia, begins on 4th May, and there is another period of eight days later in the year.

Heald, who reported on the agriculture of the Hadhramaut in 1921, says :—

> "The rain-fall along the coast is practically nil, some years they have one or two inches, but useless for agriculture, the floods being from the interior rain a long distance from Mukalla; when we were in the district from December to April, we had two or three showers, but every time too small for the rain gauge to measure.
>
> "The climate between October and April is healthy and suitable for travellers, but after that it becomes too hot for day marching; in fact, in April, some of the shut-in wadis were unbearable and we were very glad to leave the interior for the coast. Up in the hills in the winter months, it can be intensely cold."

POLITICAL DEVELOPMENT IN THE HADHRAMAUT

HAROLD INGRAMS

INTRODUCTION

131 To the Arab geographers the Hadhramaut is a province of South
114 Arabia, to the west it remained until 1934 an imperfectly explored part
of the peninsula with the chiefs of which Great Britain had had treaty
relations since the end of the nineteenth century. From 1934 till the
present time it has been my good fortune to explore it, to live in it and to
be associated with its political development.

631 Politically it consists of six treaty areas, the Qu'aiti State of Shihr and
Mukalla, the Kathiri State of Seiyun, the two Wahidi Sultanates of Bir 'Ali
643 and Balhaf and the two tiny sheikhdoms of 'Irqa and Haura. Juridically
all these treaty chiefdoms are of the same status, but the premier chief is
the Qu'aiti Sultan of Shihr and Mukalla who has the title of Highness and
a salute of eleven guns, and after him comes the Kathiri Sultan of Seiyun
with a salute of nine guns. Until the nineteenth century the Kathiris had
been for some centuries the ruling dynasty of the greater part of the country
depending for their power on foreign mercenaries, most of whom were
Yafa'i tribesmen from the mountains of the lower Yemen. In course of
time these mercenaries became more powerful than the Kathiris and from
them arose two dynasties, first of the Kasadis and then, conquering them
and much of the Kathiri country, the Qu'aitis.

133 The Hadhramaut is essentially a desert region, with a negligible and
132 uncertain rainfall, in which the inhabitants have from a respectable antiquity
evolved elaborate systems of irrigation to make the most of their
312 limited water and infertile soil, on which they have probably never been
able to support themselves. But as the Hadhramis are commercially an
439 enterprising people they have for as far back as we have any certain knowledge
of them, a matter of rather more than 2,000 years, lived on trade.
167 The ancient Hadhramaut lived on the incense trade: when that went by
sea they learnt to emigrate and for centuries now the Hadhramis have
gone abroad to earn money in the countries bordering the Red Sea, in East
Africa, in India and most of all in the East Indies. One in every three or
four Hadhramis is always abroad, generally temporarily for it is always
their ambition to return home, and the largest colonies and the largest
fortunes are found in the Netherlands East Indies, particularly Java.
The community in Singapore is small but wealthy.

721 Until 1937 the principal feature of their life in their own country was
chronic internal strife, for despite their ability to amass money abroad
from house property, by trade—mainly in piece goods—by money-lending,

121 what people want to hear. In this short talk I would like to deal more with the feeling of these buildings as related to the people who live in them and who have created them. If time allows I hope to show a short colour film I made there and which portrays general scenes of life in Hadhramaut.

122 There is one thing I can say without any hesitation or doubt, and that is to give expression to my great gratitude to those who helped me to go on these journeys. I could not possibly mention by name all those to whom I am indebted, but at least I wish to speak of Sir Bernard Reilly of the Colonial Office, who made it possible for me to go to Hadhramaut and gave me the necessary introductions. I also want to thank Dr. Serjeant of the School of Oriental and African Studies of London University, who taught me for two years and who showed me everything I had to know in order to travel in that strange and isolated country he had himself visited. Finally, I am most grateful to Colonel Hugh Boustead, Resident Adviser of the East Aden Protectorate, who facilitated my journey in every possible way. He was my kind host and gave me travel facilities and permits to go where many people had difficulty in going.

131 To plunge into my subject, I might say that one does in fact almost plunge into the Hadhramaut from above. It is one of those rare countries which cannot be reached by rail or by road and hardly by sea except on a little native dhow; so that since the British Protectorate authorities started to develop the country it has been habitual to go to Hadhramaut by plane, and one does indeed drop into it from the sky. Such isolation is rare in our times and needs some explanation for those not familiar with the geography of Southern Arabia.

131 Arabia has always been one of the most difficult countries of access to
133 Europeans, for geographical as well as religious reasons. In the centre of the peninsula is one of the largest deserts in the world, and it is surrounded by forbidding coastal ranges from halfway up the Red Sea coast, down to the "barren rocks of Aden" and eastward along the southern coast, almost three-quarters of its length before there is any break in the mountains.

But for small valleys, these mountains and the interior are absolutely barren. With the exception of the Yemen, to all intents and purposes, little or nothing grows in that vast area. There is no water. There is little earth, and in the relentless mountain ranges and plateaux along the coast there is often not even sand—just rock and flint and granite. Yet these coastal ranges are crossed in all directions by ageless tracks made by camel trains of the bedouin traders who have followed them for two thousand, perhaps three thousand years, bringing the incense from Dhufar beyond Hadhramaut.

101 The people who now live in the interior highlands are the bedouin,
[342] the descendants of the traders of old, who dwell in small stone-built villages or mud castles. This south-western corner is still largely a tribal area where there are different little bedouin sultanates. Some of them are being gradually brought into the confederation and some even accept complete British protection; others live entirely in their own ancient way of
000 life of blood feuds and strife. Some miles out of Aden a sultan recently

Some miles out of Aden a sultan recently
killed two of his cousins because of some rivalry between them, and not 579
more than fifteen years ago there were cases of open piracy at Balhaf. 131
Such incidents will illustrate that it is not easy country to travel through 186
or to subjugate, isolated as it is behind roadless mountains and plateaux. 114
There are some 500 miles of this barren, rough country, where the people are fiercely independent and distrustful of outsiders. It was long impossible to travel right across it, and it has been done by only very few people, chiefly by the Dutch explorer Van der Meulen, who has crossed it three times.

Considering the geography it is not surprising that modern civilization, 177
and particularly European civilization, has never penetrated the interior of this peninsula. In such outcrops of continents as this all civilization seems to come and go very slowly, and so does life itself. The Indo-European civilization, which started in the Fertile Crescent before the time of Ur of the Chaldeans, has only very slowly percolated down to this outcrop of Asia, as it did in the peninsulas of India and Malaya; once there, it remained static and almost intact for 4,000 years. When one goes to Hadhramaut now one can almost imagine living in the time of Abraham of Ur and the Chaldeans.

The Hadhramis themselves trace back their ancestry and history to 773
Noah, from whom they descend through Sem and his grandson Ad, who
is their legendary father of the giant race, and from whom in turn descends
Hathermaveth, whose name means "Death is Present" and became [101]
"Hadhramaut." This shows that in those far-off days the Arabs of Southern Arabia were hardly less bellicose than they were until the British came to Hadhramaut in 1934, when Mr. Ingrams started negotiating cessation of wars and blood feuds.

Hadhramaut, we know then, lies 400 miles from Aden eastwards along 131
a roadless coast, across merciless basalt mountains, quicksand, dunes and
deserted beaches—400 miles of sand and rock and ragged cliffs, with only 133
five unknown bedouin fishing hamlets en route. Going along this coast—be it by plane, dhow or, at last, since 1951 by pioneer desert trucks—one can hardly believe that any form of life is possible inside or behind these torrid treeless wastes. For behind these coastal ranges, to the north, we know it is the great desert that covers all Southern Arabia, the Empty Quarter, which has but four or five oases along the 600- or 700-mile camel route that crosses it. Neither from north nor south is there seemingly any life vein, nor from east nor west. Yet it is here that we shall find the valley of Hadhramaut.

Like the hidden valley of Petra, Hadhramaut has remained secluded throughout the centuries, but with this difference: the valley of Hadhramaut is not dead.

When one has braved the 400 miles of desolation eastward from Aden, 133
one suddenly comes upon a great scintillating white harbour; a crescent 311
moon wedged between an azure bay and blistering pink rocks. This is [504]
Mukalla, the beautiful white-and-blue port, the cup of its harbour filled with many little native craft and sailing dhows. Behind the town there seems nothing but endless waste tableland with one or two poor bedouin hamlets—the Jol, rising to 6,000 feet and stretching 150 miles inland. But

133 a second miracle happens. There is a cleft in the great basalt plateau and
a beautiful green valley opens abruptly in the flat tableland—a valley running
311 from east to west, joining the sea some 150 miles further on. This
is a fertile valley with gardens and palm groves, millet fields and white
palaces. An underground river continually provides water for the wells
and the little irrigation channels. There are crops up to three times per
year. In this lovely setting very civilized and well-dressed townsfolk live
in large mud-built towns on the valley cliff sides. Recently they have laid
aside their arms and ceased their blood feuds and tribal wars which raged
from town to town, from tribe to tribe, from family to family. With the
aid of the British adviser they have established law and order and made
their foreign trade, which is their livelihood, flourish unhindered.

172 When we go back into history to find out where this miracle has sprung
341 from, we discover that there were the old Sabean and Hymyaritic civilizations
of 1,000 or 2,000 years B.C., of which Mr. Ingrams spoke. Perhaps it
started with [illegible] Minean Empire, on the eastern border of Yemen, and its
capital, Ma'in. Later came the Sabeans with their capital a little south, at
Marib; followed by the Katabaneans, whose centre, Timna, was at the
south-eastern corner of the great desert. And lastly, perhaps, the Hadhramis,
whose early capital may have been the much disputed Shabwa. These
people built in stone, and their buildings were several storeys high and of
very fine dry masonry. Many are the ruins covering the western territory
between Aden and Hadhramaut and to the north in Yemen. But also in
Hadhramaut itself, further east, there are vestiges of towns and temples,
in the main valley and the side valleys; great plans of garrison cities, and
remains of castle and palace walls in beautifully executed stonework, all
erected perhaps some 2,000 years ago.

341 With such a tradition it is not surprising that something is still found
333 in the present day, and although the Hadhramis have not continued the
stone masonry and have turned mainly to sun-dried mud bricks, their
achievements are of remarkable interest.

101 Reviewing the various groups of the population, there are the bedouin
342 who still live by camel transport, the sand bedouin of the desert who live
in simple black camelhair tents, and the bedouin mountain tribesmen who
live on the arid plateaux. The latter are rugged and tough, like the
country round them. Their life is hard; it is scorching hot without any
shade in the day, bitterly cold at night at 6,000 feet. They still build their
low windowless huts with brushwood roofs with the stones of the plateaux
in dry walling. They carry on in their primitive way the stone tradition
which has been lost elsewhere in the eastern area.

361 The next class of inhabitants we meet are the remote valley bedouin,
who live in rather better circumstances. They do have a little grazing,
311 cultivate a little land where they grow millet called dharrah and a sort of
342 little cucumber-tomato called faguws. They live in the earthen beds of
long-dried-up rivers that have a flood from the hills about once a year.
They have grown lazy like everyone else, and they build their little castles
of mud bricks with a base of rough stones from the river-bed. A passage
342 down the centre leads from the entrance door with almost windowless
rooms for storage either side to a stair leading to a sheltered roof terrace.

132 mount steadily, until travel at midday becomes unpleasant and is not even practiced by the thoroughly accustomed Bedouins. At [484] the peak of summer, travel is reduced to a minimum, and that undertaken only at night, probably more out of consideration for the Bedouin's valued beast of burden than for himself. A period of extreme heat lasting about forty days, known as the "arbainia" (*arba*, Arabic for "four"), usually begins about May 4, and there is another period of eight days later in the year.

The atmosphere, especially on the Jol, is exceptionally clear, save when an occasional dust storm darkens the sky. The dust storms affect large areas, for the wind-borne material is fine and easily distributed; but they do not extend to high altitudes. Fliers over the Jol report that at a few thousand feet above ground level the air normally remains clear. When moisture-laden winds are blowing landward from the Gulf of Aden, cloud banks cover the narrow coastal zone between the sea and the precipitous margin of the interior plateau.

Few or no instrumental data are at hand regarding rainfall in this part of Arabia. Heald, who reported on the agriculture of the Hadhramaut in 1921, says:

> The rain-fall along the coast is practically nil, some years they have one or two inches, but useless for agriculture, the floods being from the interior rain a long distance from Mukalla; when we were in the district from December to April, we had two or three showers, but every time too small for the rain gauge to measure.[1]

THE PLATEAU AND ITS BORDERS

● 133 In the Hadhramaut the narrow, sandy coast is bordered by a belt of mountains 30 miles wide. At the western edge of the Hadhramaut, about 100 miles east of Aden, rugged coast ranges rise to 7000 or 8000 feet. They are succeeded on the east by slightly lower table-topped and scarp-bounded mountains, whose height gradually decreases to about 2000 feet at Ras Fartak.

Between these mountains and the interior desert of Rub' al Khali, the southern border of which runs parallel to the coast at a distance of 200 miles, stretches a highly dissected and terraced tableland, sloping very gently to the north and east. Dissection is greatest in the Hadhramaut, Maseila, and Hafif drainage basins; the fringe of the interior desert shows considerably less erosion. The eastward slope of the plateau has an average gradient of 1 in 500 (in the 610 kilometers between Hafif and Shabwa the surface rises from sea level to 1200 meters). The over-all northward component of slope is less, perhaps 1 in 1000; it cannot be determined because the altitude of the Rub' al Khali is not known. The gradient is not uniform,

---

113 [1] Quoted by W. H. Ingrams: A Report on the Social, Economic and Political Condition of the Hadhramaut, *Colonial No. 123*, London, 1936, p. 8.

1

however. The floor of the Hadhramaut Valley rises at a slope of 1 in 900 or 1000 from an altitude of 2000 feet at Tarim to about 3000 feet in the latitude of Shabwa and the west end of the tableland. 133

The observer in the Hadhramaut is impressed by the vast amount of rapid erosion that has taken place and the inadequacy of the rainfall of today to explain it. Not only topographical but also cultural evidence points toward increasing aridity in the Hadhramaut. The numerous visible ruins, not to mention those buried by sand or disintegrated past recognition, are indicative of a greater population than now exists. A large number of the present-day inhabitants 167 emigrate; and, according to Mr. Ingrams, they have been doing so 161 at an increasing rate during the last fifty years.[3] It is suggested that the Hadhramaut area supports about the maximum population under the prevailing conditions of rainfall.

[131]

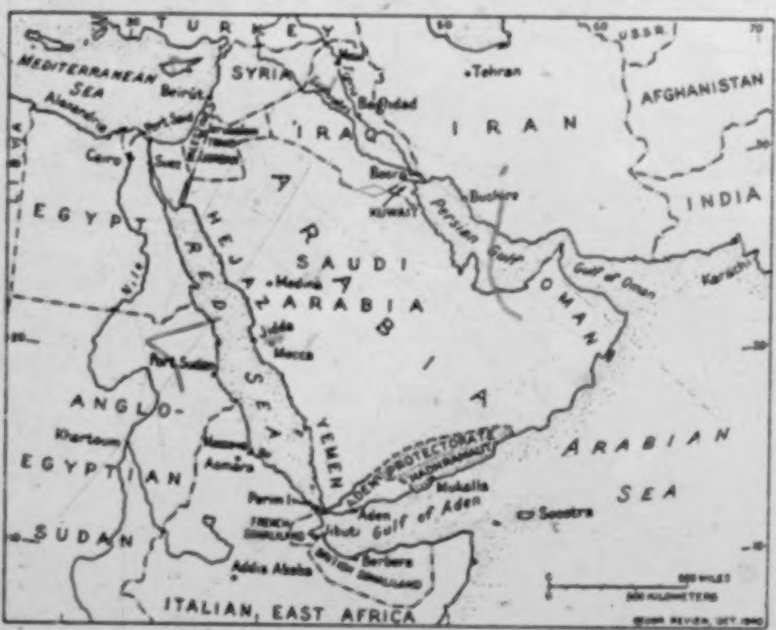

TURKEY
MEDITERRANEAN SEA
Alexandria
Beirut
Port Said
SYRIA
Bagdad
Tehran
U.S.S.R.
AFGHANISTAN
IRAQ
IRAN
Cairo
Suez
Basra
Bushire
KUWAIT
Persian Gulf
INDIA
EGYPT
Nile
HEJAZ
ARABIA
SAUDI ARABIA
Medina
Jidda
Mecca
RED SEA
Gulf of Oman
Karachi
OMAN
Port Sudan
ANGLO-EGYPTIAN SUDAN
Khartoum
Asmara
YEMEN
ADEN PROTECTORATE
HADHRAMAUT
Mukalla
ARABIAN SEA
Perim I.
Aden
Gulf of Aden
Socotra
FRENCH SOMALILAND
Jibuti
Berbera
BRITISH SOMALILAND
Addis Ababa
ITALIAN EAST AFRICA
500 MILES
500 KILOMETERS
GEOGR. REVIEW, OCT. 1940

FIG. 1—The Hadhramaut, Aden Protectorate, in its wider strategic relations. Scale 1: 40,000,000.

Each of the canyons excavated by the Wadi Hadhramaut and its 133 tributaries in the vast South Arabian plateau suggests to the traveler a miniature Grand Canyon. The walls rise steeply for a full thousand feet throughout the deepest part of the drainage system and remain perpendicular, although decreasing in height, even to the heads of the smallest tributaries. To the observer on the ground the plateau

---

[3] W. H. Ingrams: Hadhramaut: A Journey to the Sei'ar Country and through the Wadi Maseila, Geogr. Journ., Vol. 88, 1936, pp. 524–551; reference on p. 527. 113

133
361

8: Pike N-4 (no date) 1940 MM2 Hadhramaut MM2

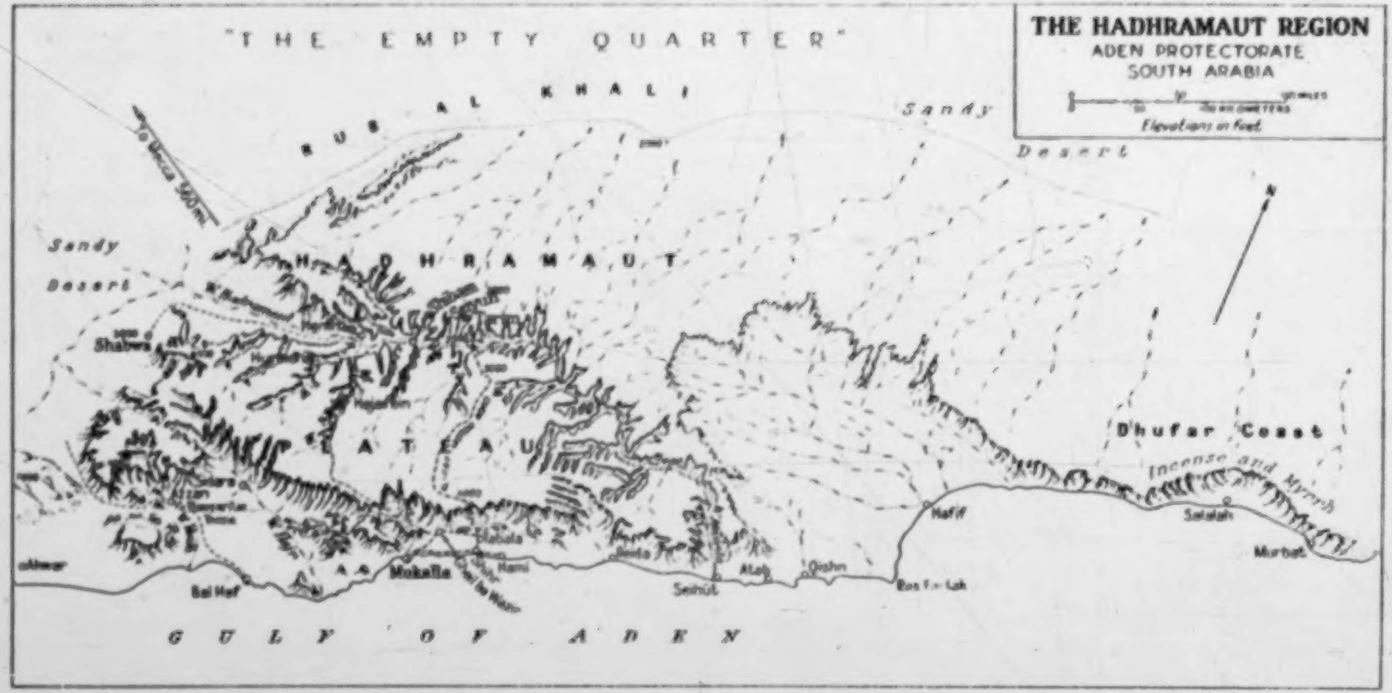

THE HADHRAMAUT REGION
ADEN PROTECTORATE
SOUTH ARABIA
Elevations in Feet
"THE EMPTY QUARTER"
RUB AL KHALI
Sandy Desert
Sandy Desert
To Mecca 500 mi.
HADHRAMAUT
PLATEAU
Shabwa
Dhufar Coast
Incense and Myrrh
Haff
Salalah
Murbat
Ras Fartak
Qishn
Seihut
Mukalla
Bal Haf
GULF OF ADEN

FIG. 2—Diagrammatic sketch of the Hadhramaut illustrating the dissection of the plateau by the main wadi and its tributaries and the relation to other drainage systems. Mukalla is about 300 miles east-northeast of Aden, in 14° 32′ N. and 49° 07′ E. (See Fig. 1).

133 presents the appearance of an undissected plain stretching to the horizon, broken here and there by flat-topped, isolated hills and extensive rock terraces. Only by a campaign of "trial and error" can one find where the drainage divides are and the limitations the drainage imposes on freedom of movement in this treeless and apparently obstacle-free terrain. Even the smallest wadi constitutes a formidable obstacle; for should descent be possible, the chances of finding a route to scramble up the opposite wall are small. With
487 almost limitless time at their disposal, the Bedouins have obtained a comprehensive picture of the stream system and have adjusted their caravan routes accordingly, utilizing the relatively few suitable passes from wadi level to plateau level. From a distance these century-old trails appear as inconspicuous paths; yet along the passes and narrow parts of present caravan routes, some of which are thought to be identical with the incense roads of antiquity, one may observe that once-jagged rocks have been rounded and polished by the passage of countless unshod men and soft-footed camels during several thousand years.

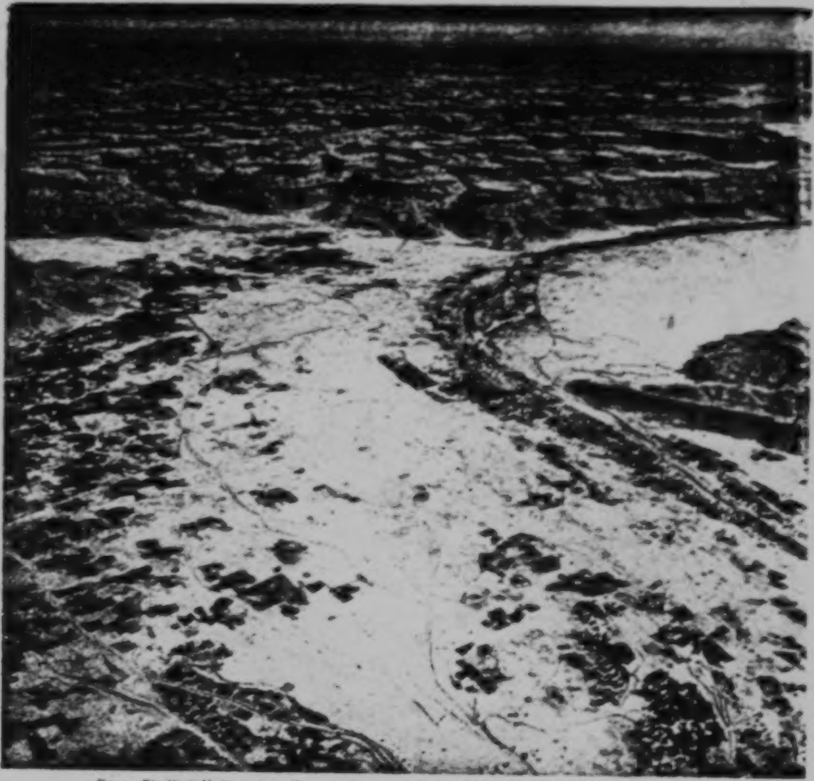
HADHRAMAUT–MASEILA DRAINAGE SYSTEM

133 The drainage of the Hadhramaut is divisible into four systems: (1) Wadi Hadhramaut–Wadi Maseila; (2) streams flowing north to the interior basin of the Rub' al Khali desert; (3) eastward-flowing streams entering the sea on the Hafif coast; (4) small and short streams tributary to the Gulf of Aden.

To the west of Tarim the main stream is known as the Wadi Hadhramaut, to the east as the Wadi Maseila. It has been explored on foot by Mr. and Mrs. Ingrams for 360 miles from its mouth to the longitude of Shabwa, where the valley walls, 1000 feet high, diverge and flare off to the north and south, leaving a sandy, featureless plain, studded with low dunes and occasional salt-incrusted flats, stretching westward toward the mountains of Yemen, 200 miles away.

For much of the distance below Tarim the water flows above ground; but upstream the bed is dry and water must be obtained
[312 from wells 30 to 45 feet deep. The supply seems adequate for present-
132] day domestic and irrigation requirements, and acute water shortages are uncommon. During the summer there is some rain in the interior, especially in the mountains of Yemen, and water then flows down the valley all the way to the coast, at times becoming a flood. It is suggested that the present direction of flow of the Wadi Hadhramaut may have been achieved in recent time through piracy by a rapidly eroding stream flowing south to the coast, which has succeeded in diverting drainage that formerly flowed westward into the Rub' al Khali via the broad western part of the valley.

133



312
245

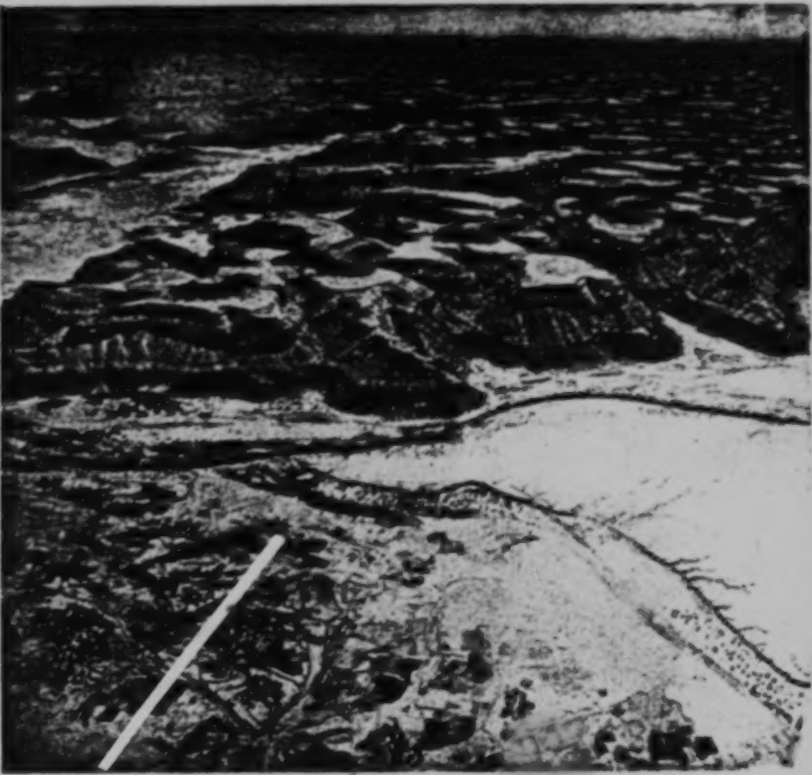
Fig. 3—The Wadi Hadhramaut at Tarim, looking eastward, i.e., downstream. Tarim, surrounded by its wall, is at the left. Trees in the broad alluvial-filled valley are date palms, irrigated by water hand-drawn from wells. The dissected character and even summit levels of the Jol (plateau) are clearly seen. Canyon walls along the wadi are 900 to 1000 feet high. Irrigation ditches to direct occasional floods are discernible everywhere on the wadi floor.

438

Fig. 4—A caravan carrying wood to the market in Tarim.

P. 632

133



48'1

FIG. 5—This view is practically panoramic with Figure 3. Along the crest of the nearest plateau spur may be seen a sinuous white streak, which is the Al Kaf road to the coast, distant 100 miles as the crow flies, 170 by speedometer. It may be observed that in this direction there is less stream dissection and greater expanse of unbroken plateau. The narrowing of the wadi downstream should be noticed.

312

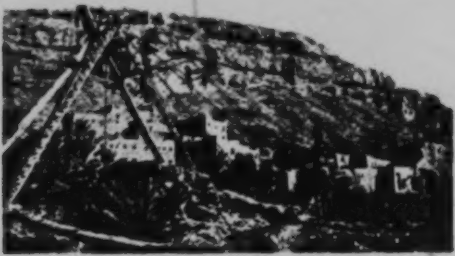


FIG. 6—Well irrigation. Note the rude palm log scaffolding.

p.633

• 133

Near the coast the wadi gradient is considerably steeper than in the central and upper parts, where the slope is only 1 in 1000. There seems to be no local cause to explain the anomaly.[3] Although there are a few small lava flows in the Maseila Valley near the coast, it is obvious from the steepness of the gradient, the size of the valley both above and below them, and the absence of old lake shores that they have not constituted a local base level. Neither does the river cut through abnormally resistant rocks of any other type, which might conceivably restrict erosion.

Usually a stream and its valley decrease in size from mouth to source, except where superimposed on resistant strata. The Hadhramaut drainage system, however, is broad and well incised near the mouth, narrow and less deeply incised in the middle, and much wider and deeper farther upstream than at the coast. In its middle part the main stream is not appreciably larger than its tributaries, and it is suggested that in this region lay the former headwaters of a westward-trending drainage. It seems impossible that the vast quantity of material removed during the creation of the great valley from Tarim westward could have been transported to the sea without more erosion than is evident in the vicinity of the hypothesized piracy, about midway between Tarim and the mouth.

As a result of what seems to have been a gentle epeirogenic movement in the region west of Tarim, both the valley floor and the adjoining plateau slope gently upward in this direction at a gradient of 1 in 700 or 1 in 1000. A gradual uplift in the west and south, which is, moreover, in the direction of rock exposures from which sediments have been removed, would have assisted piracy in bringing about a reversal of drainage. Such a sequence of events would well account for the alluvial fill in the tributaries of the main wadi. As the water wells do not penetrate the valley fill to bedrock, the thickness and distribution of this alluvial deposit in the Hadhramaut-Maseila drainage system are not revealed, but an observer gains an impression that it measures perhaps several tens or even hundreds of feet.

A more detailed picture of the interrelationships between, and relative importance of, epeirogenic uplift and stream piracy will, it is hoped, be gained when the Hadhramaut has been more thoroughly explored. That piracy was accompanied by underground drainage as well as by downcutting is suggested by the porosity of some of the rock strata. Subsequent alluviation, however, has obliterated the former entrenched parts of the valley and thus deprived the observer of many desirable details of physiographic history.

It must be noted, however, that tributaries to the Wadi Hadhramaut to the west of Tarim and also for a short distance to the east

113

---

[3] G. Caton-Thompson and E. W. Gardner: Climate, Irrigation, and Early Man in the Hadhramaut, *Geogr. Journ.*, Vol. 93, 1939, pp. 18-38.

enter the main stream normally, i.e. the angle between main and tributary streams is acute. This suggests that the present drainage prevailed during the period of tributary incision and contradicts the hypothesis of stream reversal. On the other hand, tributaries in the area thought to be that of the former headwaters of westward drainage join the main wadi as if it once flowed in the opposite direction. 133

The apparently normal direction at which the tributaries west of Tarim join the main wadi cannot readily be explained from the data in hand; the problem requires critical study. However, it is felt that the evidence of abnormal stream profile and the relatively small amount of erosion in the central part of the valley outweigh any argument against change in the direction of flow.

STREAMS TRIBUTARY TO THE RUB' AL KHALI

Northward from the east-west drainage divide of the Hadhramaut-Maseila and Hafif systems innumerable slightly incised wadies, in a former extensive tableland, carry intermittent runoff toward the Rub' al Khali desert, where the water is absorbed and the stream channels become choked. The drainage pattern is dendritic; but the main streams, although broadly meandering, maintain a rather uniform direction down the steepest gradient of the plateau surface.

Although little is known of this region and not until recently was it observed by members of the Royal Air Force to be inhabited, it can safely be said that aridity is higher than in the Hadhramaut-Maseila basin, which is favored with annual floods from Yemen, and in the coastal zone, where a number of springs exist.

STREAMS TRIBUTARY TO THE COAST AT HAFIF

Eastward from the point where the Wadi Hadhramaut swerves from its east-west course toward the coast a drainage basin of similar trend carries runoff to the Gulf of Aden in the vicinity of Hafif. This drainage area is bounded on the south by steep-gradient streams to the sea, on the west by the Hadhramaut basin, and on the north by the drainage province tributary to the Rub' al Khali. It measures some 140 miles in length from east to west by 80 miles in width; the area is some 11,200 square miles.

The watercourses of the Hafif area are thought to be intermittent. 312 Nowhere is the water table known to reach the surface. Undoubtedly water is obtainable, as in certain parts of the Hadhramaut, by means of wells favorably located in the main drainage lines; for no other source of supply for the people of this sparsely inhabited area is apparent.

The drainage pattern exhibits both rectangular and dendritic characteristics, the former being most evident along the main streams. 133

O. Pike N-4 (no date) 1940 MM2 Hadhramaut MM2

133

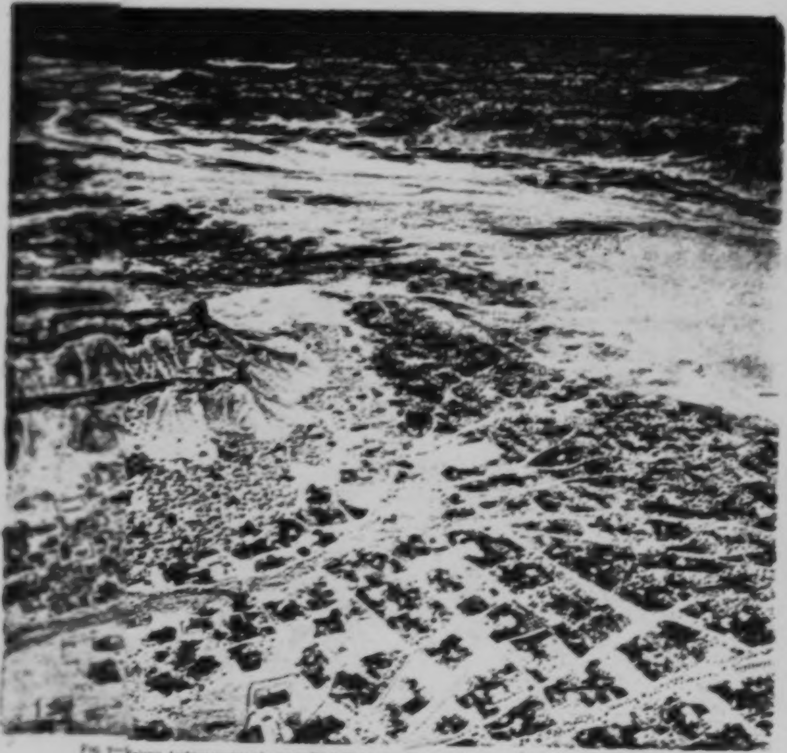


FIG. 7—Seiyun, looking westwards up the Wadi Hadhramaut toward Shibam (see Fig. 6). The large white building with a dark oval in the foreground is the resthouse with swimming pool shown in Figure 10. The magnificent palace of the Sultan (Fig. 8) is below and to the right of the rocky promontory against which the town lies. The upper right-hand margin of the photograph shows the dissected plateau in the direction of the Rub' al Khali desert about [illegible] miles to the north.

344

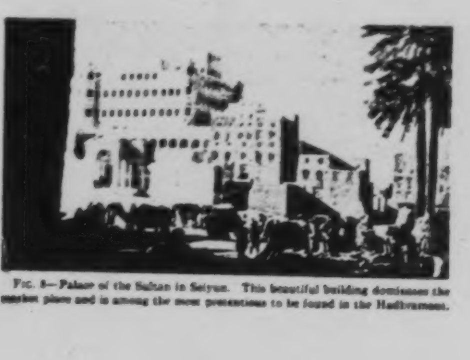
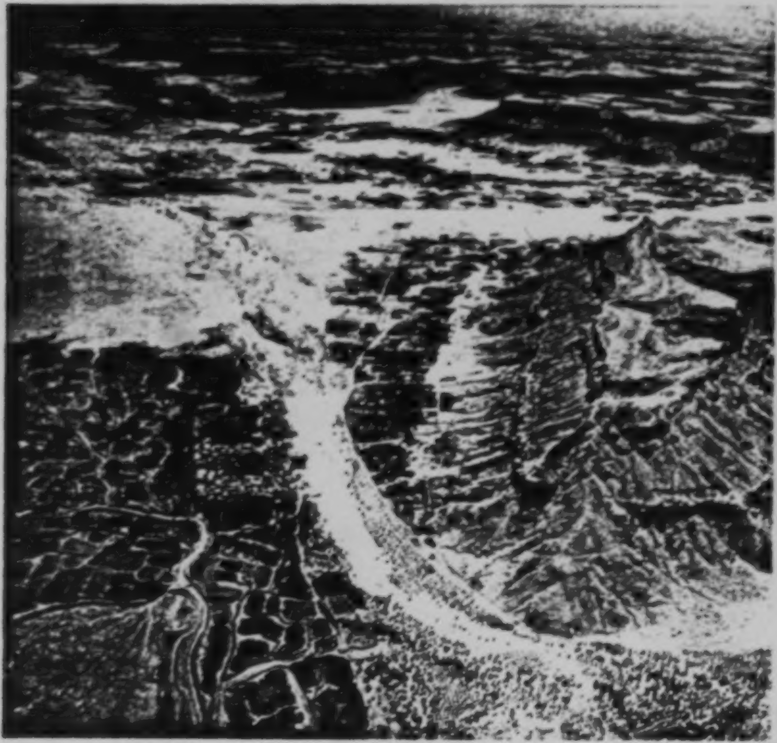


FIG. 8—Palace of the Sultan in Seiyun. This beautiful building dominates the market place and is among the most pretentious to be found in the Hadhramaut.

P. 636

133



361
342
556

Fig. 9—Shibam, looking down the Wadi Hadhramaut toward Seiyun (see Fig. 7). Shibam is built on a low hill at the tip of a plateau spur and, for lack of space, grew upward: the buildings are eight to ten stories high. The landlord occupies the upper stories and these parts are whitewashed: the more whitewash, the wealthier the owner. Note the abandoned fields embanked to prevent runoff of water. The upper right-hand margin shows the plateau topography in the direction of the sea, a hundred miles distant.

485

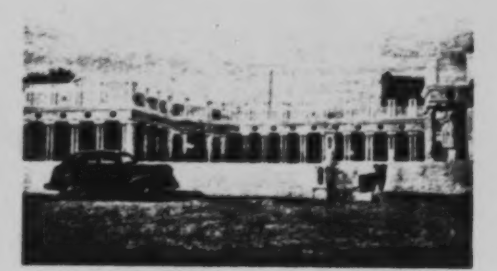
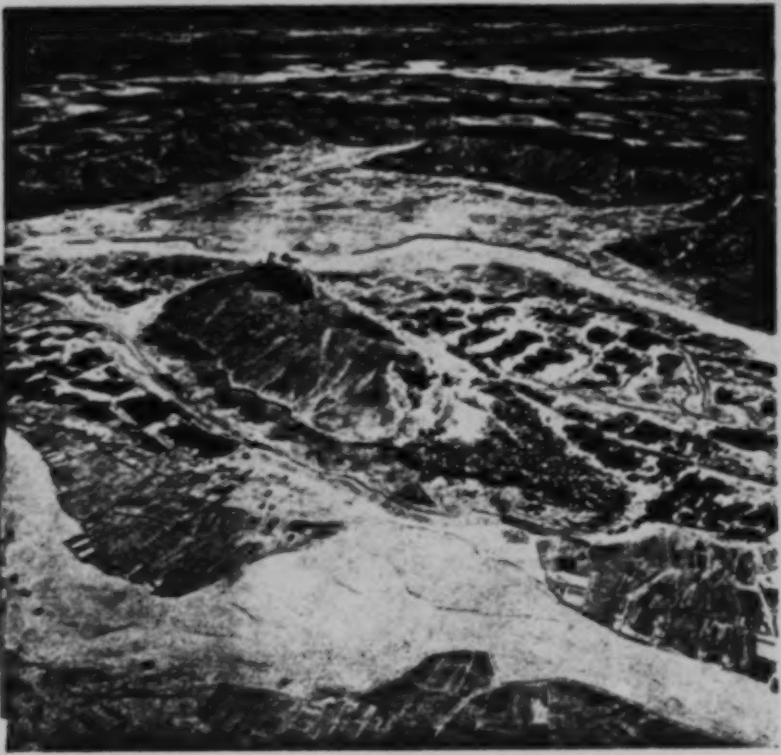


Fig. 10—European guest house at Seiyun. Only one half of the mansion is in view. Most of the courtyard above the steps is occupied by a swimming pool.

p. 637

133



361
245
312
487
333

FIG. 11—Hajarein, the largest city in Wadi Do'an, is on one of the principal caravan routes between Mukalla and the Wadi Hadhramaut. Its site was obviously chosen with an eye to defense. Groves of cultivated date palms and millet fields may be seen amid a series of earthen retaining walls and irrigation ditches. As in other cities of the Hadhramaut, adobe brick is the building material.

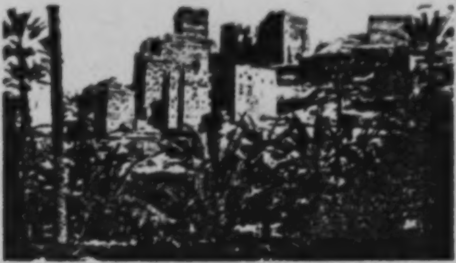
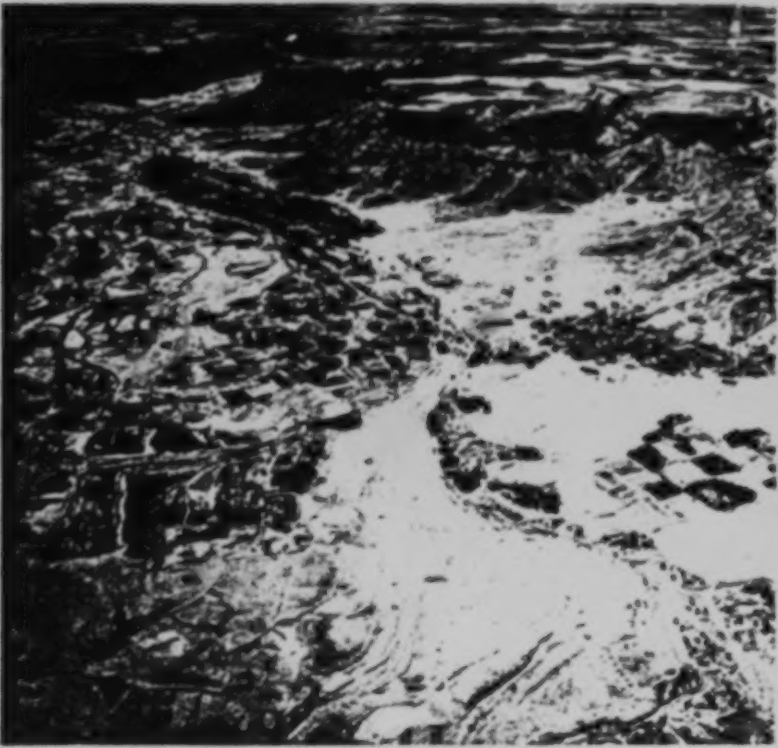


FIG. 12—A typical, fortified, Arab settlement on the banks of the Wadi Hajr. The irrigated groves of date palms furnish the main foodstuff.

p. 638

133



361

Fig. 15—Hureidha, in the Wadi Amd. Like a majority of the Hadhramaut cities, it is located on a semi-protected spur. Both used and abandoned agricultural areas may be observed throughout the broad valley. This view over the tableland looks southward toward the sea and illustrates the steep-walled nature of the drainage system among even the smallest streams.

172

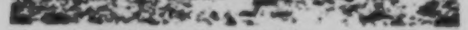


Fig. 16—Recently discovered ruins along Wadi Hajr, near Azzan, dating from the time of the pre-Islamic Himyaritic kingdom.

p.639

361

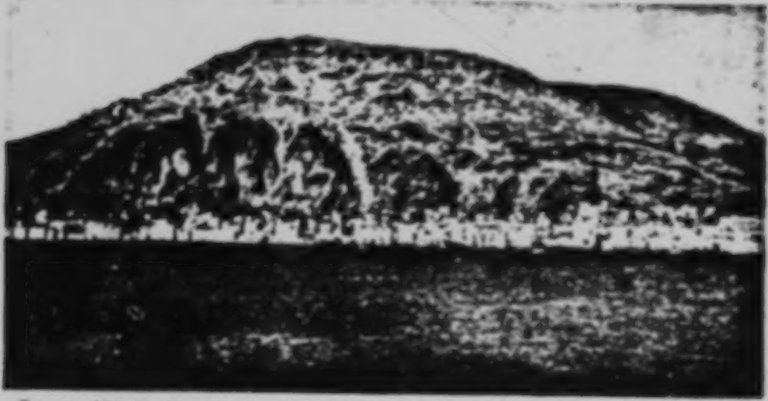


FIG. 15—Mukalla from the sea. The skyline of the second largest settlement and commercial center on the south coast of Arabia.

133 Gradients are low, not more than 1 in 500 and very probably averaging about 1 in 750.

STREAMS NEAR THE COAST

The area between the coast and the southern margin of the Hadhramaut-Maseila and Hafif basins, some 500 miles long, is drained by short, intermittent, steep-gradient mountain streams, few of which, except certain sections of the Maseila, are perennial. The best known of these is the Wadi Hajr, which enters the Gulf of Aden at Ras al Kalb, 50 miles southwest of Mukalla. Another is the Wadi Meifa, about the same distance beyond Hajr. Both of them, although they have not been traced to their sources, are reasonably reported to be fed by springs.

504
361
396

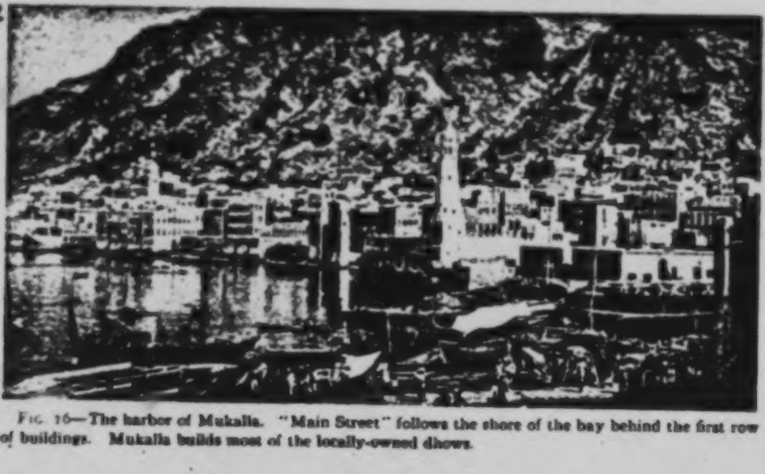


FIG. 16—The harbor of Mukalla. "Main Street" follows the shore of the bay behind the first row of buildings. Mukalla builds most of the locally-owned dhows.

172

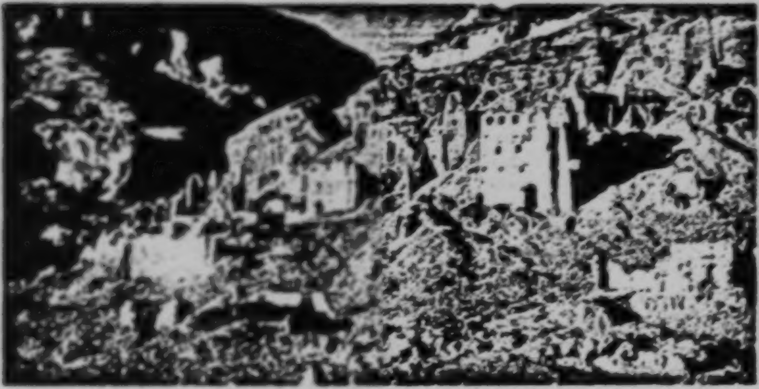


Fig. 17—Ruins of a pre-Islamic city in the Wadi Masila. The site was chosen for defensive purposes and each house was in itself a fortress.

HOT SPRINGS

133 [135] Hot sulphurous springs are widely scattered in the coastal zone, and fairly accurate accounts of many of them are available. They commonly deposit gypsum in quantity. Some of the deposits are so large as to suggest either that activity was more general in the past or that the position of the spring outlets has shifted. The springs may be attributed to the same subterranean conditions that prevail in Yellowstone Park, where descending waters become superheated through close association with uncooled rocks and rise again to the surface.

3/2 241 361 [271] Within half a mile of the coast of Hami, east of Mukalla, several hot springs are utilized by the natives for irrigation of date palms and millet and also for drinking. Neither here nor elsewhere does the

[3/2] Fig. 18—A view in the Wadi Masila where water is present during most of the year. The edge of the Jol appears in the background.

648 to advise him in his rule so as to establish confidence in him as a ruler, to help in agriculture, medical work, and schools. The work done so far has been of an experimental nature, but a measure of success has been achieved in the Beihan and Ahwar areas, and work in other areas, such as Shaibi country, has been started. I have not been in close touch with the work, but I believe the experiment is distinctly promising. If there is a weakness about it, it may be that there is not sufficient promise of continuity—that is to say, it may be it is too dependent on one man, the chief. The areas are small, there is no government establishment. If you have an establishment one man may fail and you can put another in, but the thing continues. If you have only one man, and he dies, there is no guarantee that his successor will be like him. Even if a political officer is permanently in the country he is dependent on there being a co-operative chief, unless he is to run the country himself.

871 The W.A.P. is almost entirely tribal, as I have said; there is therefore
212 little culture. Indigenous schools are rare and there are none beyond the
Quran school stage. Illiteracy is very general. But there is little doubt
that schools, if provided, will be quickly filled. The main question is
000 what will the newly educated do in their own countries? Certainly there
is room for educated chiefs and for the comparatively few who are, or will be, required to help them in governing or providing social services. But the opportunities there will only absorb a few and there are no mercantile communities worth mentioning. There may be scope for some technical training and even agricultural training, but it is not easy to see how the tribesman already expert at the cultivation of oases, terrace cultivation in the comparatively few parts where agriculture is possible, is going to be given an education which will greatly assist him. There are few areas where over-education could cause more trouble with discontented literates than the protectorate. So that a question that to my mind still requires much thought is—what sort of education can be given which will help the advancement of the country and not upset it? And I don't think that a satisfactory answer is yet forthcoming as to what can be the future of the W.A.P. Until it is answered it is difficult to decide on the lines education should follow, for there is nothing old to build on.

THE EASTERN ADEN PROTECTORATE

133 So much for the W.A.P. The Eastern Aden Protectorate provides a
great contrast. Perhaps it may be helpful to catalogue the contrasts
briefly. In the first place, the area of the E.A.P. is between 70,000 and
80,000 squares miles, while that of the W.A.P. is between 30,000 and
[161] 40,000. The estimated population* of both is about 300,000, so that the
E.A.P. is much more sparsely inhabited. But the bulk of the population lives on the coast and in the Wadis Du'an and Hadhramaut 100 to 150 miles inland. So that there are vast areas which are practically uninhabited. Therefore there are bigger distances to cover between communities. In the second place, as I have already said, the total acreage of cultivable land is very much less than the W.A.P., and the people who own it are much less agriculturally minded than the farmer-owners of the W.A.P. It is an essentially desert country, with the Rub'al Khali just

behind it, and not the high mountains of the Yemen. Its height above the sea-level nowhere exceeds 6,000 feet and is generally not more than 3,500. It has therefore no regular rainfall. 33

Then, as regards treaties, while the W.A.P. has a total of about thirty-five chiefs in direct relation with His Majesty's Government, the E.A.P. has only seven, of which one, the Kathiri, is comparatively recent. The reason is that in the E.A.P. all that was required was to keep foreign powers off the coast. All the six original treaties with E.A.P. rulers were with coastal chiefs. Starting from the west, 'Irqa and Haura are only small villages. The two Wahidi Sultans come next, then the Qu'aiti, the largest of them all, whose state to-day covers some 50,000 square miles, and then the Mahra, which includes Socotra Island. While the W.A.P. is historically part of the Yemen, and has now a new and natural capital in Aden which supplies it with all its requirements, the E.A.P. is historically and geographically detached and has a local commercial capital in Mukalla, but looks to India, Singapore, and Java for its cultural and social contacts. 648

The Hadhramaut is historically and geographically a country in itself, and consists of the Wahidi Sultanates, with the two little Sheikhdoms of 'Irqa and Haura, which are really ports in the country of the Dhiyeibi tribe, who are a Wahidi tribe, and the Qu'aiti and Kathiri States. I propose not to say anything more of the Mahra country because as yet little is known about it, though in the last year or two more has been learnt of Socotra. 101

You will have gathered, I think, that, owing to its desert nature and lack of rainfall, the prospects of the development of agriculture in the Hadhramaut are not very promising, and as the various explorations that have taken place to date have not discovered any mineral resources, it does not look as though the economic future is very bright. The best agricultural areas are Gheil Ba Wazir, on the coast, where Hamumi tobacco is very successfully grown, and this brings in a revenue of about Rs. 200,000 a year to the state, and Meifa, in which conditions have been considerably improved in the last few years and where some further development is possible. It was hoped that the alluvial silt of the Wadi Hadhramaut would prove a fertile area for wide development if water could be found, but experiment has shown that it is largely brackish and, bearing in mind the desert surroundings, it is probable that any further supplies of water which boring might discover would not be sufficient to wash out the salt. It is unfortunate, too, that the bulk of the population, the seiyids and tribesmen, do not take to working on the land themselves, as do the tribesmen of the W.A.P., but rely on dhafa, a class of poor townsmen who are almost in the position of serfs. These dhafa lived by building the palaces of the rich and working their wells, but the fall of Singapore and Java cut off the supplies of money from the Far East so that the rich could no longer maintain them. The beduin had lived by carrying supplies from the coast to the interior, but with the falling off of imports they too suffered. On top of this catastrophe there was a seven-year drought from 1937 to 1944, which meant the loss of crops, flocks, and 50 per cent. of the working camels, so that between the difficulties of 241 311 565 463 731

133 soft silt could be carried to the middle courses of the streams. The two cycles were separated by a phase which was marked by extensive volcanic activity, especially in north-east Yaman, where the lava spreads always cover the old gravels and underlie the silts. The second cycle was followed by erosion, during which new torrential beds were cut into the silts (sometimes producing a series of erosional terraces). There has also been a still more recent (historical) outburst of volcanic activity (on a much more limited scale), the accompanying features of which are still noticeable in hot springs, etc.

We were able to associate the two physiographic cycles (or at least their depositional phases) with pluvial episodes. During Quaternary times this corner of Arabia seems to have had two major Pluvials separated by an Interpluvial. It was not possible to work out the stages of the first Pluvial, which was a prolonged one, and which must have had more than one sub-maximum (as shown by terraces); but there is presumptive evidence from one or two places that the second Pluvial may have had two sub-maxima separated by an Intrapluvial. In recent times there was a new wet phase (shown by archæological and other evidence), which we believe to have continued well into the Christian era (perhaps to the fifth century A.D.).

ARCHÆOLOGY

172 The south-west plateau of Arabia proved to be singularly poor in prehistoric remains. Perhaps the great height (mainly above 1,500 m.) and the unfavourable climatic conditions during pluvial episodes contributed to this. It is to be recalled that very few remains have thus far been found at the high altitudes (above 6,000 ft.) of the opposite coasts of East Africa. We have carefully examined gravel exposures and have carried out experimental excavations at no fewer than fifteen caves and rock shelters in Yaman and Hadhramaut, but the results were largely negative. Surface specimens were looked for all along the route, but they were found only in very limited numbers and in particularly favourable localities; they belong typologically to Lower and Middle Palæolithic and rarely to the Upper Palæolithic. Whatever may have been the reasons, the scarcity of even surface finds shows that even if remains of prehistoric man may some day be forthcoming from this region, they will never be comparable in quantity with those from the African side. This reflects rather unfavourably on recent views put forward with regard to East Africa as a centre of cultural diffusion in Lower Palæolithic times.

Remains relating to the early historic phase of the area were, on the other hand, particularly abundant. Work and excavations at a number of places in Yaman and Hadhramaut have yielded fairly illuminating results. New light is thrown on relations between south-west Arabia on one hand and the Hellenistic East and Græco-Roman Egypt on the other, during the early centuries of the Christian era.

p. 513 (c)

[illegible] Muzayyin N-6 (1936)1937 MM2 Hadhramaut MM2

121 BETWEEN April and October 1936 the Egyptian University of Cairo sent out a scientific expedition to Yaman and Hadhramaut. It consisted of four members, and was intended to carry out researches in the fields of geology, physiography, archæology, anthropology and entomology. The expedition covered a distance of some 2,500 kilometres and was able to carry out intensive researches at various localities both on the High Plateau of Yaman and in the interior of Hadhramaut. The material brought back has not been studied in detail as yet; but a preliminary note can be given here.

GEOLOGY

121 133 One of the expedition's main aims was to work out certain problems connected with the geological history of the southern borders of the Red Sea. We worked at a number of points along the lines of rifting both south and west of the Yaman Plateau, where the old crystalline rocks (schists and granites) of the base were exposed under later (secondary and tertiary) sediments and lavas. The successive horizons of the tertiary traps of the High Plateau were carefully examined and specimens collected. In north-east Yaman we worked chiefly on Jurassic limestones and Nubian sandstones, and a large collection of fossils was made from the successive zones of the former. The interior of Hadhramaut was found to have a relatively simple structure and to consist mostly of Eocene limestones on earlier unfossiliferous sandstones. We hope that new evidence from the lower part of the Eocene may throw useful light on the date of the trap volcanic series of tertiaries in south-west Arabia.

PHYSIOGRAPHY

133 Pleistocene geology proved to be quite interesting. We worked chiefly on the middle parts of the valleys, which were relatively independent of changes in base (sea) level. Two physiographic cycles were established, the first being by far the more pronounced. Valleys with sloping sides were first cut and then filled with coarse gravels which now rise (usually in two or more terraces) to some 30 m. above the beds of the streams. During this stage there was a good deal of lateral wash and erosion in the middle parts of the valleys, and this erosion was probably responsible for the sloping sides of the V-shaped valleys. The gravels were examined at a large number of exposures, but unfortunately they produced only one or two specimens of pre-Chellean appearance.

The second physiographic cycle was associated first with the cutting of new steep-sided valleys *emboitées* in the older gravels, and then with the filling in of these new valleys with soft sediments of silt. Deposition was much more regular and there was very little lateral wash in the middle parts of the new valley-beds. The discharge during the depositional phase of the second cycle was much less than that during the depositional phase of the first cycle, as only

p. 513 (B)

boundary of the region of the āl-Qaʿētī, and were advised 000 to trust to the āl-Kathīr. About five days were considered necessary to get our caravan together, and these days were made use of for making a botanical collection on the limestone hills behind Makalla.

Von Wissmann made profile sketches of the hills, and 484 made observations to get a good base for his road survey. 486 We were thankful to make use of the permission granted 721 us by the authorities to make a trip for two days along the coast to ash-Shihr, which was formerly the most important harbor. Even a short distance inland from Makalla the country becomes unsafe. We were taken in a sort of auto-bus belonging to the sultan round the inland side of the mass of rock at Makalla, after that close along the shore, and finally even along the flat sandy shore. The bus was quite full of armed guards. We were forbidden to go by the road over the mountains, since on that road some soldiers had been killed from an ambush a short time before.

We were thankful when, after many negotiations with the leaders of our caravan, the signal for departure could be given on the afternoon of May 8. From early morning until the afternoon the vizier had had to negotiate with a group of Bedouins, who were waiting for our caravan among the rocks near the road, just outside the whitewashed boundary marks of the town of Makalla, in order to satisfy a blood-feud. The vizier knew how to bargain for a safe passage, but to be quite safe he had us taken in a government auto to a point beyond the border. In the darkness of night we were set down by the side of the road to wait for our donkeys!

The journey to the inaccessible and fanatical land of 133 Hadramaut was now begun. From the 9th to the 15th of May we traveled northwards,—first through the Wādī Himim. Finally we came to the terrible, monotonous plateau with table-mountains, known as *jōl*. For many days we marched over this limestone plateau with its basin-like depressions and its very scant vegetation.

133 During the daytime the heat was stifling, and at night it
was so cold that for hours before the sun rose I was no
longer able to sleep. The interminable, barren plain was
covered all over with sharp, loose fragments of stone,
and among these wound the narrow path along which
from morning to night we steadily wended our way.
312 Drinking water is here to be found in *negābas,* which
are cisterns hewn out of the rock some three meters below
the surface, with a narrow opening. Low ridges lead the
scanty rainfall to the *negāba.* Owing to the narrow
opening there is very little evaporation, and if one has
no rope at hand with a vessel to draw water, this opening
is just large enough to admit a man to dip it out.
485 Near the *negāba* there is usually a little square building
made by piling up rough stones in clay, this is called
murabba, and here the midday hours with their scorching
486 heat may be spent. For the sake of safety, our
609 Bedouins avoided the *negābas* as places for passing the
night. In the evening the neighborhood of the bivouac
was carefully reconnoitred, and usually sentries were
posted at night. The authorities at Makalla had given us
for our personal protection two negro soldiers belonging
133 to the famous slave army of the āl-Qa'ētī sultan. On
May 15 we reached the wonderfully beautiful valley
Wādī Dō'an. The descent of hundreds of meters of this
almost perpendicular wall of rock with loaded camels
was a difficult feat causing some anxiety; but the
Bedouins and their camels reached the valley below without
245 a single mishap. As we looked upon this *wādī,*
hemmed in by its high walls of rock, it looked like a
land of magic with its deep-green groves of date palms
[361] and its clay villages with great castles and high houses.
A glowing heat as dry as dust prevailed in Wādī Dō'an
night and day. The bright yellow and deep red bunches
of dates were hanging ripening in the hot wind. In the
shade of the magnificent and remarkably well kept trees
the population were quietly waiting for the harvest time.
144 A great deal of mixture with negro blood (of slaves) has

788 every year pilgrims assemble there from all those regions,
778 and both before and after that a Truce of God prevails
during an appointed period, in this country which is rent
484 asunder by mutual warfare. Never before had a Christian been able to get further than Terīm in the direction
of this sanctuary, and without the protection and the
planning of the powerful Sayyid Abu Bakr Al Kāf we
should not have succeeded. On the way to Qabr Hūd
361 312 we passed the magnificent ruined castles of el-'Urr and
Thōbe, and the remains of houses and a cemetery at
Makēnun. Qabr Hūd seemed to be a silent and defunct
little town, with great houses which are only occupied
for three days in a year. In the bed of the *wādī* there
appeared to be water here, but before it reaches the sea
it is said to disappear underground or else to dry up.
346 The grave of Hūd, the great preacher of repentance in
Hadramaut, is adorned with a dome which impresses
one by its simplicity and beauty. The other sacred
buildings are equally beautiful and are well kept. Where
we had expected to find a Bedouin sanctuary which was
neglected and primitive and surrounded by mud huts for
the pilgrims, we found instead on the border of Arabia's
"empty quarter," far away from the world, a sanctuary
built and cared for with devotion and great talent.

● 133 We entered still further into the branch valley of Barhūt, and at the end of this *wādī* we saw at a height of about one hundred meters above the bottom of the valley the dark yawning chasm of the Bīr Barhūt, of which even the ancient geographers furnished descriptions, and definitely anticipated that there must be here the crater of a great volcano. After an investigation of two hours in the dark passages, arches and tunnels of Bīr Barhūt we were able to determine that we have here to deal with an ordinary limestone cave. Nowhere in this region did we see any trace of volcanic action. It was only in the broken ridge of mountains on the coast that we saw many traces of volcanic action. Further north the strata are horizontal; a layer of limestone about a hundred meters in thickness lies on a likewise horizontal layer of sandstone. Owing to this, the valley profiles throughout Hadramaut are monotonously uniform. 133

On the 7th of June we left Terīm. With some difficulty we had succeeded in securing the sympathy and cooperation of Sayyid Abu Bakr for our plan of trying to reach Aden overland. The baggage would be sent direct to ash-Shihr, and thence by sea to Aden. We could take with us only as much as we could carry with us on our riding camels. With a small escort and fast camels we should then perhaps be able to pass unnoticed through the region where there was war. This plan fell through. We were continually coming upon territory through which we could not pass. By way of Horēda we passed through the Wādī 'Amd to a place where, beyond 'Amd, the territory between two contending parties compelled us to make a circuitous movement through the country of the Deyyin Bedouins. Even though we traveled rapidly with a small party we were continually compelled to make new detours. In so doing we got still further away from our original goal, namely, Nisāb (or Ansāb), which is the furthest English outpost in the hinterland of Aden. At Yeb'ith, where the attitude of the population was antagonistic, and where our food supply seemed to be extremely limited, we gave up the Aden plan, and decided to make rapid marches direct to Makalla. At Sidāra we entered the Wādī Hajr, the only *wādī* in South Arabia where there is always running water. At Mēfa'a we reached the coast. Through the difficult mountain range along the coast we went as far as the fishing town of Borūm. Then we followed the coast to Makalla, where we arrived safe on the afternoon of June 21. 609 133 361

The return journey had been partly through territory never yet traveled. Von Wissmann was thus in a position to put on his map the exact connection between Hadramaut and the hinterland of Aden. By this conclusion of 000

THE SOUTH-WEST BORDERLANDS OF THE RUB' AL KHALI

D. G. BUNKER

121 126 As a result of work carried out for the Desert Locust Survey in south-western Arabia during the past few years, several of the blanks on the map have been filled in and much confirmation has been given to previous travellers' reports. The region particularly investigated has been that which forms the transition belt from the peripheral mountain system to the interior sand desert often referred to as the Rub' al Khali. The area visited has been mapped on a scale of 1:500,000 by means of car-compass traverses tied to astronomically determined positions, all to a general accuracy of 0·1 of a mile. The following notes are intended only to supplement the information contained in those maps which are in process of publication.

The mountain systems

133 The old crystalline hills of the 'Asir and Yemen, which to the west drop in a series of steps to the Tihamah or coastal plain, are to the east overlain by near horizontal strata of sedimentary rocks of which the oldest are probably the sandstones forming the Kaukab plateau and the newest, excluding recent deposits, are the Eocene limestones of the *jol*, the succession seeming more complete in the north. The peripheral mountain system is in the form of a letter L, where the upright stroke comprises the 'Asir and the Yemen mountains and the horizontal stroke is the *jol* plateau, the division being more or less abrupt along the line of the forty-seventh meridian.

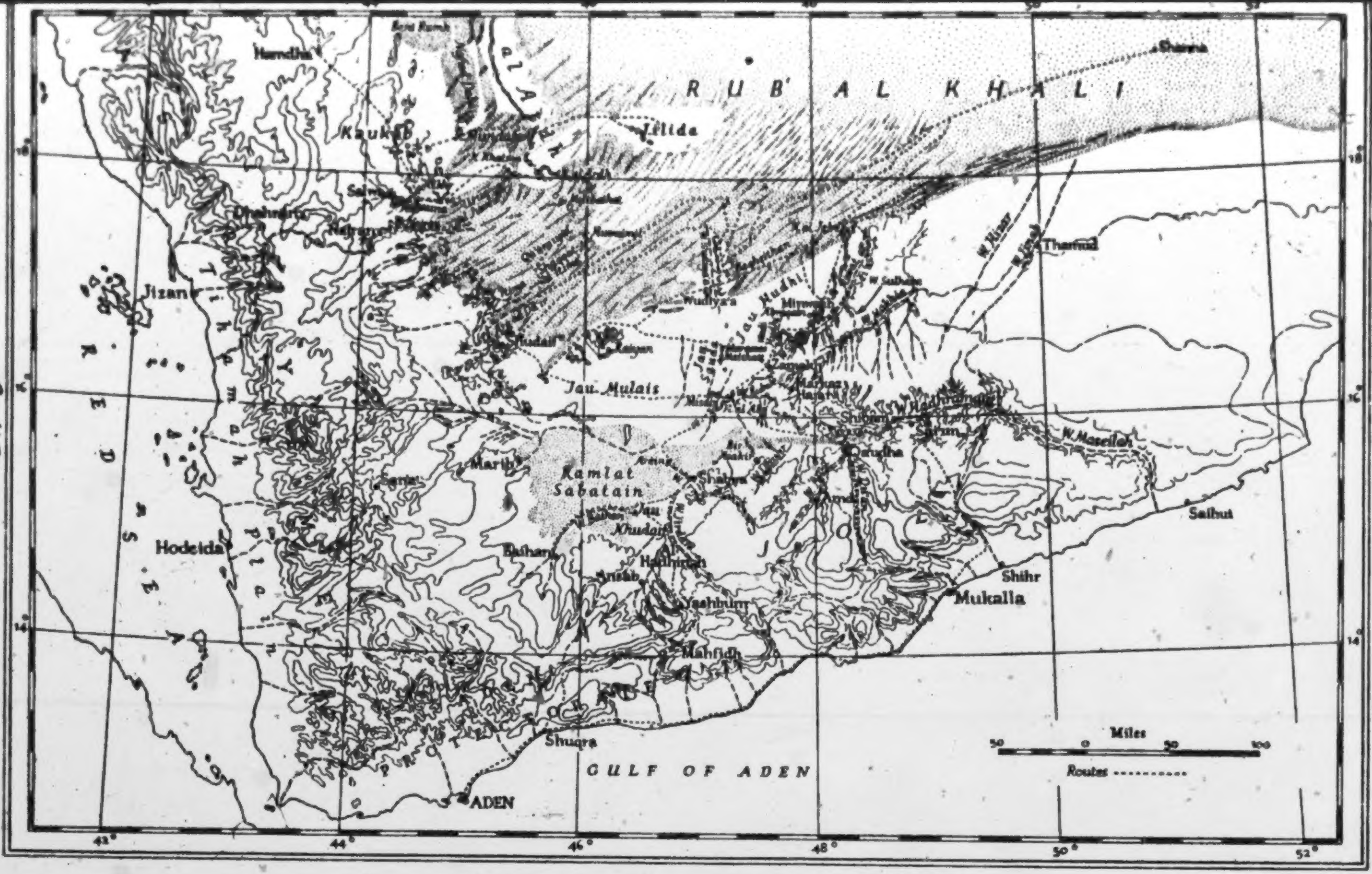
Philby (1938) describes the change between the two sides of the 'Asir watershed as "abruptly from a tropical country to a desert plateau of uniform height of over eight thousand feet (with higher ridges), descending to about six thousand feet at the western end of the Najran tract. It is a sandstone area with occasional cappings and peaks of basalt. Its rugged gorges and valleys have occasional wells and springs, but for the most part it is an abomination of desolation extending north-ward to Dhahran and south-ward to the limit of vision into the still unexplored territory of northern Yemen." Nevertheless there are among the eastern slopes many wadis whose seasonal floods may rush out of the mountainous regions to the inland plain and on into the sandy desert.

The regularity of these floods in the past may be deduced from the extent of the thick layers of silt which mark the sites of past damming and irrigation works in nearly all these wadis. These silt layers often form 20-foot cliffs containing the present watercourses, and occasionally the ruins of the dams themselves may be found. The Wadis Habauna and Najran, besides having silt cliffs, show signs of further re-cutting of their outwash plains. In both cases the outwash plain extends regularly for the first 10 miles from the foothills but during the next 5 miles is eroded by gullies some 3 feet deep which together form a plain at a lower level, only to be re-cut in the same manner.

p. 428

15: Bunker N-4 (ca. 1950) 1953 MM2 Hadhramaut MM2

p. 421



RUB' AL KHALI
Hamdha
Kaukab
Jilida
Dhahran
Najran
Jizan
Tihamah Plain
YEMEN
RED SEA
Hodeida
Marib
Harib
Ramlat Sabatain
Jau Mulais
Wudhiyah
Jau Hudhi
Shabwa
Shibam
Tarim
W. Hadhramaut
W. Maseilah
Thamud
Saihut
Shihr
Mukalla
Beihan
Ansab
Yashbum
Mahfidh
Shuqra
ADEN
GULF OF ADEN
Miles
50 0 50 100
Routes
42°
44°
46°
48°
50°
52°
18°
16°
14°

South-west borderlands of the Rub' al Khali

133
104

133 In those parts visited, three such steps were noted in Wadi Najran and two in Wadi Habauna.

The line of the eastern foothills of the 'Asir and Yemen mountains continues in a curve south-east from Najran through Marib and Baihan to Al Hadhinah, about 14° 30′ N, 46° 50′ E. From here southwards through Mahfadh to the coast the crystalline rocks disappear under the cover of horizontal strata of nodular Eocene limestone which forms the plateau of the *jol*. The western limit of this *jol* continues north-east from Al Hadhinah to the Khashm al Jebel, 17° 30′ N.

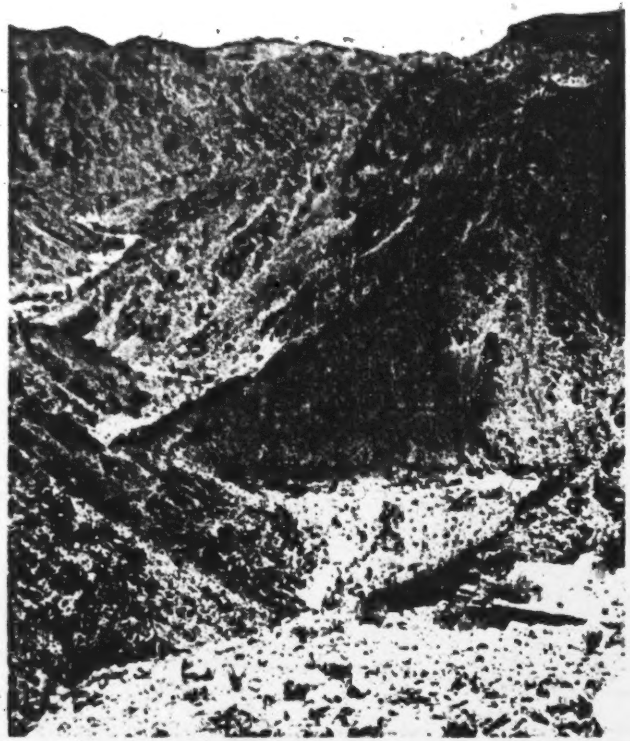
At the Khashm al Jebel the plateau has an elevation a little over 2000 feet rising gently south-south-westwards till at 16° N. the altitude is 3000 feet at Sai'un and 3400 by Markaz Hajar and Husn al 'Abr. South of the Wadi Hadhramaut the strata continue to rise until some 40 miles inland from the coast, where an increasing amount of faulting occurs and blocks of the *jol* have been forced to heights of over 6000 feet. Here too begins the volcanic activity evidenced by lava flows and signs of contact metamorphism, with a thin stratum of limestone overlying the igneous rocks (Plate 1).

The wadis of the jol

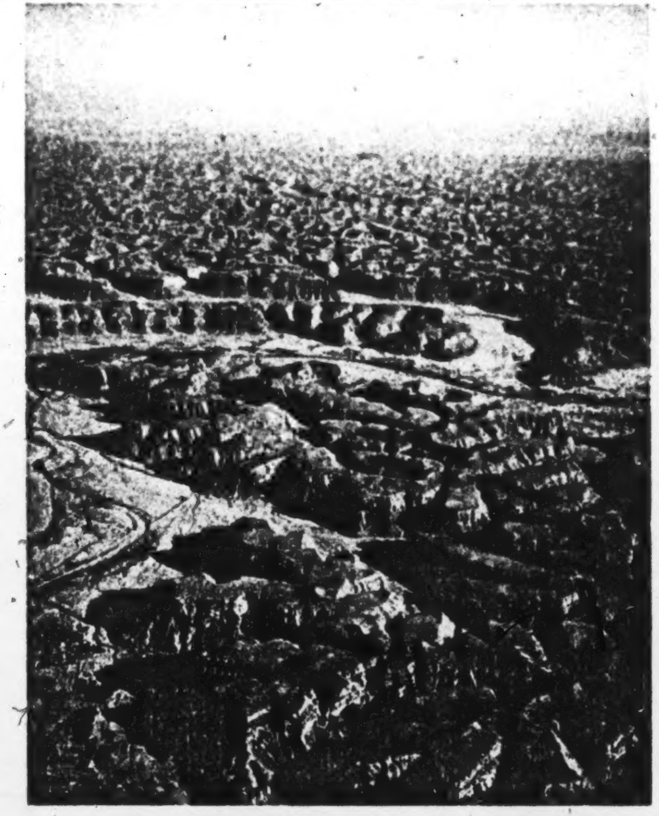
The deeply incised wadi courses which descend through the *jol* in a series of steps between high cliffs have excited the curiosity of travellers from the earliest times (Plate 2). The Bents (1900) thought that the erosion had been caused by marine action, but the general theory of climatic fluctuations has since suggested that there may have been sufficient rain in the past to have produced the present landform. Fisher (1951) remarks that the feature of the wide upper reaches of the Wadi Hadhramaut would seem to be the result of wadi capture, and it is suggested that this theory can be elaborated to account for the whole pattern of the present *jol* drainage.

The original drainage was north and south from the 6000-foot watershed. There may have been an east–west fault along the line of the present Wadi Hadhramaut which caused the north-flowing rivers each to have a short eastward reach along the line of the fault before continuing north again. One of the south-flowing rivers, the Maseilah, cut back through the main watershed at about 15° 40′ N., 50° 50′ E. and initiated the series of river captures on a line parallel to and inland of the watershed. In this it would have been helped by the existence of a fault line or similar line of weakness, though the absence of such a line of weakness does not materially affect or invalidate the hypothesis. The west–east course of the Hadhramaut–Maseilah system formed in this way dominates the present drainage pattern. The upper reaches of the north-flowing rivers would now have become north-flowing tributaries to the Wadi Hadhramaut, while the lower reaches would have been left headless or formed their own much shallower heads at the subsidiary watershed now created to the north of the Hadhramaut. This is supported by the statement by Thesiger (1949) that "the wadis flowing north from the Hadhramaut watershed are shallow at their heads, in contrast with the north-flowing wadis from Dhufar which begin in deep canyons." Once the north-flowing wadis from Dhufar are compared with the north-flowing wadis from the main watershed, *i.e.* the north-flowing tributaries to the Wadi Hadhra-

FACING p. 422



1. *Thin stratum of limestone (top right-hand corner) overlying igneous rocks, on the west road from Mukalla*



2. *Part of the jol with the Wadi Hadhramaut, east of Tarim. The cliffs are approximately 1000 feet high*

15./ Bunker N-4 (ca. 1950) 1953 MM2 Hadhramaut MM2

133 maut, and not with their beheaded remnants north of the subsidiary watershed, then the similarity becomes obvious. As would be expected from this theory, the south-flowing tributaries to the Wadi Hadhramaut have heads even deeper than those on the main watershed. Given a short eastward displacement in the courses of the original rivers, then it is possible that the Du'an and 'Amd drainages originally fed into the Hizar and Jinab respectively.

The completion of the present phase of river capture occurred when the headwaters of the Hadhramaut cut right back and out of the western edge of the *jol*, and formed the unusual and almost unique feature of the wide upper reaches in a line from Husn al 'Abr to Shabwa. The headwaters cut back rapidly across the plain which had been formed by the wadis 'Arma, Jirdan, Baihan, etc., and carried all the waters from them down to the Maseilah and the Gulf of Aden, whereas before they had drained towards the Persian Gulf. This capture has left a vast dry plain, the Khudaif–Mulais basin, with dry watercourses up to 2 miles wide. Several such courses may be seen in the Wudiya'a area, and have banks 20 feet or more deep, and floors of heavy fluvial gravels.

A series of levels carried out in early 1951 showed river capture still occurring around Husn al 'Abr. Here short, steep-profiled tributaries to the Wadi Hadhramaut are cutting back into the headwaters of the Wadi Hudhi, which flows north-eastwards past Zamakh with the cliff edge of the *jol* forming its right bank. Hills such as the Misair group have been isolated from the rest of the *jol*, and both Misair and Rubah retain the flat-topped character of the *jol*. The cliff face of Rubah is only some 200 feet high on the north where it descends to the Hudhi, but on the south it drops 500 feet to the Hadhramaut. Levels were also carried out in the Minwakh area and showed the capture of the lower waters of the Hudhi and the waters of the Sibr, Kor, Sulhaba, etc., which had been tributary to it. The point of capture of these rivers by the Aiwat as Sei'ar is at Shasun, about 10 miles downstream from Minwakh

The pattern of settlements

361
133
491 The siting of settlements in the mountain areas is dependent on agriculture with its requirement of a workable tilth and water at a manageable depth. Among the crystalline hills these conditions are best fulfilled at the foot of the torrent course, where the first patches of riverine plain appear. Thus there is a series of settlements from Ranya through Bisha, Tathlith, Hamdha, Salwa, Najran, Shudaif, Marib, Baihan, and Ansab to Al Hadhinah, and all these settlements can be reached by motor transport from the inland plain by driving up the wadi bed. Penetration upstream of the settlements is frequently difficult as the bed becomes stony and boulder-strewn, and all pretence of riverine plain ceases.

133
311 In the *jol* the wadis descend in a series of steps which are caused by strata more resistant to erosion. The horizontal section of each of these steps has retained sufficient silt for agriculture and water is also available. Moreover the vertical cliff faces, sometimes higher than the width of the valleys they contain, cut off the morning and afternoon sun, thereby considerably reducing

133 the amount of evaporation. Accordingly we find in the north–south wadis a
311 continuous belt of cultivations with hamlets of a few houses every mile and towns about 15 miles or an easy day's walk apart. As opposed to this the cultivations in the Wadi Hadhramaut, which runs west–east, are to be found mainly in belts along the northern and southern sides, the south belt being wider than the north, due to the increasing evaporation and lower water table towards the centre of the wadi.

311 Except for the hamlets which occur among the fields, the buildings make
361 use of unproductive land, and perch up against the cliff side on the talus slope. This position also carries the advantages of shade together with good siting for defence. Where land is at a premium, villages may be so sited as to become inaccessible even to the draught and load-carrying beasts used in agriculture, and the stables and grainstores are found at the edges of the fields and at the foot of the narrow winding path leading up to the village (Plate 3).

[104] Water for the permanent cultivations of *dhurra* (*Sorghum* sp.), *dukhn*
312 (*Pennisetum typhoideum* et spp.), lucerne and date palm has until the last few
406 years been drawn by man or animal power, raising a leather bag of water by
241 walking down a ramp away from the well shaft. Nowadays greater use is being made of diesel- and petrol-driven pumps, increasing both the yield and the area it is economical to cultivate. The effect of these pumps, which are available on deferred terms, in lowering the water table will be watched with care. New crops such as potatoes, the brassicas, and sugar cane are also being introduced under the agriculture scheme in an attempt to make the Hadhramaut, if not entirely self-supporting, at least less dependent on its "extra-territorial population."

241 This limitation does not apply to the flood crops which are snatched
312 wherever possible. Throughout the lower wadi systems there exists a com-
361 plicated network of deflector dams which have the object of spreading the floodwaters over as large an area as possible, and leading a certain part of them into irrigation channels. Many retaining dams have been attempted, but usually unsuccessfully, as the major structure has been an earthwork with only the spillway of durable construction. In the shallow beds of the wadis running north from the secondary watershed there are many small cultivated patches and groups of two or three fortified houses are often situated where camel tracks converge on water cisterns cut into the rock.

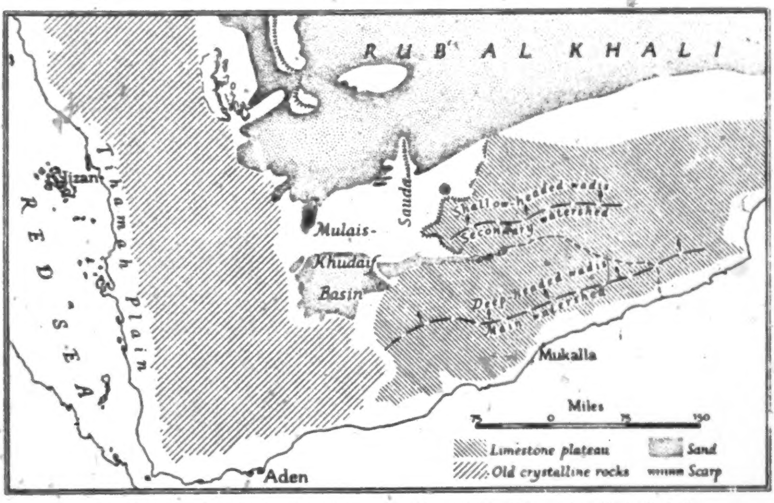
The transition belt.

133 The transition zone between the mountain systems and the sand desert takes a number of forms. North of the Ramlat[1] al Mundafan the Kaukab sandstone plateau overlies the crystalline rocks to the west, and to the east has eroded to become an area of minor plateaus and blocks. Through the wide flat valleys between these minor plateaus runs the main Najran–Dawasir track, roughly north–south in longitude 44° 45′ E. at a general height of a little under 3000 feet. To the east of this track lies the southern section of the Nafud Dahi, running parallel with the road, and rising to a height of 100 feet

---

104 [1] Ramla(t): a general name for any sand feature. Thus the Ramlat al Mundafan means literally "the buried sands."

above it. It is a sandstone feature some 25 miles wide and has a covering of loose sand which tends to conceal its structure. However the sand cover becomes so thin along the highest part that the vegetation takes on a reticulated pattern in conformity with the fissure pattern of the sandstone below, suggesting that the ridge is either a shallow anticline or more probably a low west-facing escarpment concealed by the surfacing of loose sand. On the most southerly extension of the Nafud Dahi there are a few parallel dune chains oriented to 220° and 1 to 2 miles in length with a lateral spacing of 1 mile between groups. The slip faces are to the south-east, and the dunes about 20 feet high. According to local information the dunes are more 133



South-west borderlands of the Rub' al Khali: geological detail

abundant to the north, and the orientation of the Beni Rumh sands is to the north-west, but this area was not visited.

To the east, the Nafud Dahi descends easily to a north–south plain some 10 miles wide and 100 miles long lying at a height of 2600 feet at the foot of the Ardh scarp. This scarp, which is the southward continuation of the Jebel Tuwaiq, is of possibly Triassic calcareous felspathic sandstone overlain by a sheet of Jurassic limestone of great purity but covered by "desert varnish" giving it the appearance of old ivory. The scarp varies from 200 to 250 feet in height and between 19° and 20° N. lies in longitude 45° 10′ E., interrupted in 19° 53′ N. by the Wadi Fau. South of 19° N. the scarp turns to the south-east, loses height due to the east-north-east dip, and reaches 18° 32′ N., 45° 25′ E. The parallel dune chains of the sand desert proper lie on top of the scarp and from 2 to 4 miles back from the edge, with the exception of one line, the Ramlat al Mundafan which, in line with the ends of the other dunes, disappears into a depression of the Ardh scarp known as the Muqta'a al Tuwaiq, 18° 30′ N., 45° 30′ E. and continues, "buried" from sight, out on to the plain at the foot of the scarp. Motor transport can be taken up the 133 491
scarp at this point.

133 scarp at this point. The general alignment of the dunes is to 245° with the slip face to the north-west. The height is about 70 feet. As the Mundafan sands continue south-west they become divided into two sections by the *'asfal* [1] Wadi Habauna, a flat gravel plain on which no sign can be found of the Nafud Dahi scarp. The northern section continues unbroken to the eastern edge of the Ukhr block, a sandstone feature separated from the Kaukab plateau.

South of the *'asfal* Wadi Habauna as far as Shudaif the character of the transition zone is entirely different. Here parallel dunes reach right across to the foothills of the 'Asir and Yemen mountains leaving at the most a narrow plain but a few miles wide. For upwards of 20 miles from the base of the mountains, isolated granite crags may be found between and among the sand [487] dunes. Driving through this area frequent detours have to be made out into the sands or in among the foothills to avoid the barrier formed by sand meeting hill. To pass the south-western end of the 'Arq ad Da'ir in 1952 necessitated a journey 6 miles further into the foothills than that recorded by Philby in 1936.

Shudaif marks the southern limit of the Rub' al Khali sands, and from here south-east stretches a vast triangular area of plains bounded to the north by the sands, to the east by the cliff wall of the *jol*, and to the south-west by the Yemen mountains. It has an area in the order of 150,000 square miles, and is divided into three sections, the Jau [2] Mulais, the Jau Khudaif and the Jau Hudhi by the Ramlat Sabatain and the Sauda scarp, which runs west and nort[illegible]ively from Husn al 'Abr. The process of formation probably took place in three stages, of which the first was the planation of the archaean rocks before the deposition of the sedimentary strata. The second was the removal of this sedimentary cover by north-flowing wadis which were constantly forced against their eastern banks by the east-north-east dip of the underlying rock surface. Two river courses may still be seen doing this, the Hudhi cutting back the *jol*, and the abandoned course by Wudiya'a (see p. 423) which cut back the Sauda scarp. The third stage is the present one of arid erosion, where on the Jau Mulais the igneous protrusions are disintegrating by exfoliation down to a base level where they become protected from the great diurnal temperature changes by the sands and gravels of the desert floor, and on the Jau Hudhi above the Sauda scarp wind erosion is making the surface more and more smooth and level.

The Jau Khudaif and the Jau Mulais together form the Khudaif-Mulais basin referred to above (p. 423). The Jau Mulais is an area of quartz gravels, covered in some places by thin sheets of sand with areas of rock protruding from a few inches to a few feet. A few larger plugs and dykes form conspicuous hills such as the Raiyan group, which is in the form of a series of lines radiating from a point about 16° 30′ N., 46° 10′ E., the granite hills rising sheer from the plain made from their own disintegration. The Jau Khudaif lies to the south of the Jau Mulais and is divided from it by the Ramlat Sabatain. There is a greater cover of sand than on the Jau Mulais,

---

[104]

[1] 'Asfal: the lower reaches and outwash plain of a wadi.

[2] Jau: literally a wide valley here becomes applied only to these extensive plains formed by the merging of many watercourses.

133
137

5. *Sandy shaqqa*[1] *bearing Aristida plumosa and Calligonum comosum. These shiqaq extend for hundreds of miles between parallel dune chains, and vary between a half and two miles in width*

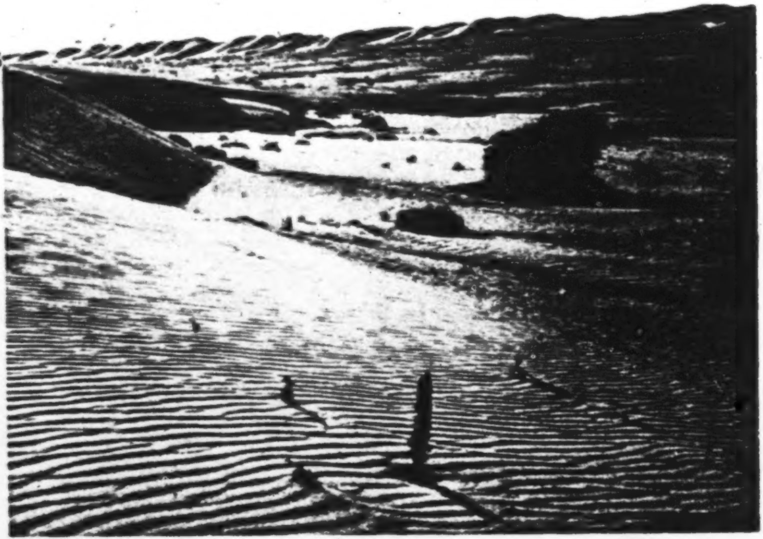
133

6. *Dune chains by the neolithic site in the Shaqqat al Khareitah. The dunes run to the south-west and the photograph was taken looking north*

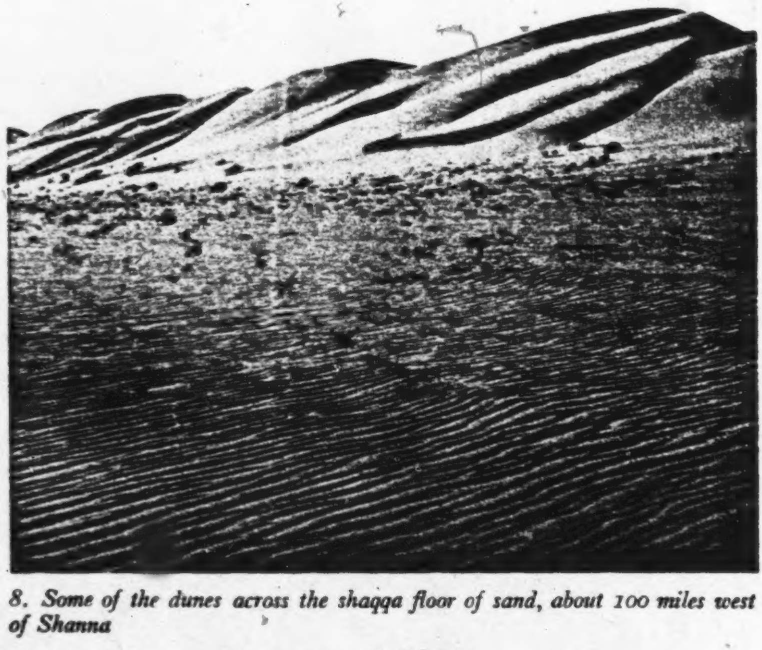
FACING P. 426

[1] [The 'valleys' between parallel dune chains -- Analyst]

153



7. *Dune chains north of the Khashm al Jebel. The shaqqa is about half a mile wide*



8. *Some of the dunes across the shaqqa floor of sand, about 100 miles west of Shanna*

FACING P. 427

133 and besides the [illegible] foothills to the south-west there is a line of hills formed by salt domes along the foot of the *jol* to the south-east. In this area too may be fou[illegible] deposits and occasional volcanic craters.

The sands [illegible] Sabatain lie east–west south of the 16th parallel, and are comp[illegible] from the sands of the Rub' al Khali. In the west, where they lie [illegible] Yemen hills, they measure some 50 miles in width from north to [illegible] o the east they taper to a width of about 10 miles where they enter the Wadi Hadhramaut, and then lie within the wadi as far east as Qa'udha with isolated sections even farther east by Shibam and Sai'un. Near Baihan and near Shabwa the orientation of the dunes is to 290°, with the slip face southwards. Near Shabwa this direction has been used to give an easy crossing from Nasar to Arain, and between the dunes may be found a well marked camel track which was possibly part of the old incense route. South of al 'Abr the dunes lie at 230° and from here curve in a large arc east and south-east until they run almost due south to near Bir 'Asakir. From the east–west section another group of dunes breaks off to run in a similar curve south into the mouth of Wadi Dhuhr. Farther east the alignment is east–west and south of Qarn Qaima there is a reticulated area of overlapping crescentic dunes about 8 feet high and with their slip faces west.

Many wadis from the Yemen hills run into the western section of the Ramlat Sabatain and are dissipated within the sands, but the Wadi Baihan
[137] forces its way through the sands in a series of deep silty channels between the
[104] dunes which are here fixed by bushes of *arta* (*Calligonum comosum*) and runs out on to the Jau Khudaif. By using this wadi, Baihan can be reached from the Wadi Hadhramaut and also from Aden by the new route from Mahfadh, which makes use of the Yashbum gorge and the line of discontinuity between the crystalline hills and the *jol*.

North of the Ramlat Sabatain, the Jau Mulais is limited to the east by the Sauda scarp. This scarp, which is of sandstones similar to those of the Karoo and possibly of Triassic origin, runs north from near Al 'Abr and includes the hills of Murassas, Maishatt, Wudiya'a, etc. It gets its name Sauda, literally "the black," from its covering of hardpan and pebbles heavily impregnated with ilmenite (Plate 4). Its position marks the westerly limit of limestones, both Jurassic and Eocene, remnants of each of which, much confused with bands of contemporary sandstones, have been found near Wudiya'a. The whole of the Sauda area is covered with a network of intersecting animal tracks converging on salt-licks, proof that the region was once much more prolific of wild life.

133 East of the Sauda lies the Jau Hudhi, an undulating sand plain whose low
137 hill features may easily be correlated with past drainage patterns. The larger of these hills sometimes bear fragmentary remains of limestone capping in the form of small boulders. From the air distinctive vegetation patterns have been seen near Zamakh. They consist of parallel lines some 30 yards apart running north-west to south-east. There is also one west-flowing tributary from this area to the abandoned watercourse at the foot of the Sauda scarp.

133 At the Khashm al Jebel, 17° 30′ N., 48° 17′ E., the Jau Hudhi ends in a sharp point at a height of a little over 2000 feet, being limited to the east by the cliff face of the *jol*, here about 120 feet high, and to the north by the first

133 dunes of the Rub' al Khali. East of the Khashm al Jebel for over 50 miles to the mouth of Wadi Hizar the sands lie in contact with and to some extent overlying the low northern outcrops of the *jol*. These outcrops are in the form of flat-topped mounds covered with coarse pebbles of reddish marl with some thin sheets of limestone. East of Wadi Hizar the transition zone takes a further form as the outliers of the *jol* run in a line south of east and the sands in a line north of east, leaving a widening floor of gravel and desert marl. The plain is about 30 miles wide near Thamud and is reported by Thomas (1932) and by Thesiger (1946) to continue east to the Jiddat al Harasis.[1]

The south-western sands

The area of sands visited has been to the south of the 20th parallel and west of the 51st meridian. Throughout the whole of this area the sand pattern is one of parallel dune chains oriented generally from east-north-east to west-south-west and separated by long strips of flat desert floor known as *shiqaq*[2] (Plate 5). The tails of these dunes lie among the Yemen foothills and several crossings of the dunes have been made, up to 150 miles from the hills. The twenty or thirty southernmost dunes have been traced some 400 miles east to the vicinity of Shanna. In addition a large part of the area has been seen from the air.

The northern section of the Mundafan sands and the Ardh escarpment has already been described (p. 425–6). The southern section of the Mundafan sands are oriented to 205° and this orientation continues south through the 'Uruq al Juweis while other dunes break away to the north at an angle of 220°, parallel to the dunes of that section of the Mundafan which lies to the north of the *'asfal* Wadi Habauna. The slip faces of all these dunes are to the north-west.

South of the Mundafan sands the Ardh escarpment reappears running south from 18° 25′ N., 45° 27′ E. to the Khashm Khatma and then south-west losing height and disappearing into the desert floor at the Khashm al Ardh, 18° 01′ N., 45° 42′ E. This reappearance of the scarp breaks the continuity of the dunes which lie parallel to and south of the Mundafan sands, and leaves sand-free areas both on top of and at the foot of the scarp as with the northern section of the Ardh. A few outcrops of the Ardh occur southwards among the dunes, but do not break the continuity of the dune lines. In particular may be noted the Mutbathat group among which may be found traces of the old course of the Wadi Najran, and the Huwimil group at 17° 30′ N., 46° 00′ E. The final trace of the Jurassic limestones occurs at 'Abraqain near Wudiya'a.

Dune chains from the Khashm al Ardh may be traced south-west to the [419] area of the wadi Taiyyibat al 'Ism and north-east to the Jilida plain. There is a well-marked motor track made by hunting parties leading to the Jilida plain from Najran via the *shiqaq* between these dunes. By the Khashm al Ardh the dunes are oriented to 220° with the dunes half a mile apart and the

---

104 [1] Later journeys (1953) have shown, that at least as far east as the mouth of Wadi Rama, this plain is divided into wide basins by lines of low hills running north from the *jol* to the sands.

[2] *Shaqqa*, pl. *shiqaq*: the "valleys" between parallel dune chains (*'urug*).

slip faces to the north-west. Near the Taiyyibat al 'Ism the orientation is to 250° with a well marked line of riders at 215° some of which extend over the *shaqqa* floor giving a reticulated pattern. The slip face here also is to the north-west.

South of the Mutbathat as far as the Shaqqat al 'Itima, *i.e.* the *shaqqa* into which the Wadi 'Itima flows, lie the Qa'amiyat sands. These dunes, with a height of over 200 feet, are the highest dunes of the south-west Rub' al Khali. They are oriented to 220° with no pronounced slip face, and due to their width the *shiqaq* between them are always narrow and frequently eliminated. They carry riders at 210° which have the slip face to the south-east.

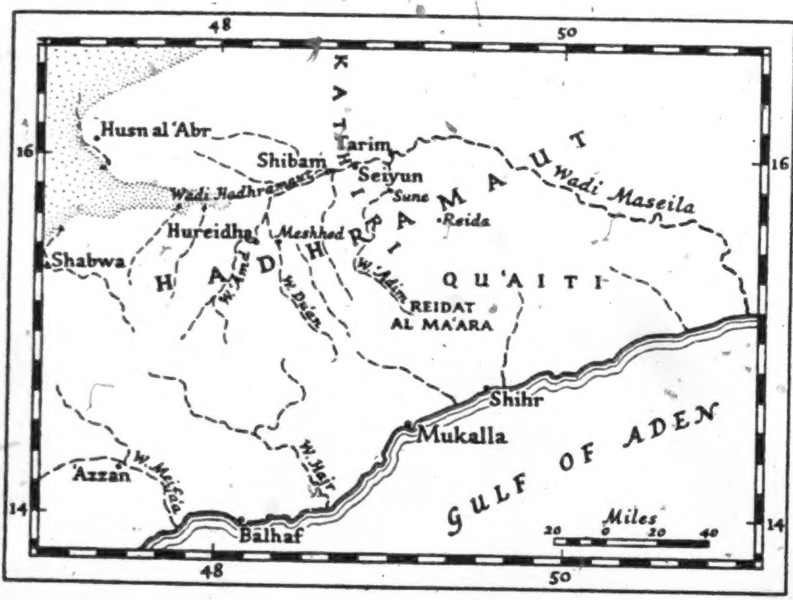
South of the Shaqqal al 'Itima and east of the Sauda scarp which penetrates 30 miles into the sands there are two distinct orientations of the dunes. The easterly section, which lies back from the foot of the scarp, consists of about sixty dune chains less than a mile apart and generally oriented to 245°. Along a distinct line between 17° 15' N., 45° 45' E. and the Raiyan hills these dunes coalesce in groups to form only twenty-five dunes oriented to 225°. The slip faces of all these dunes is to the south, and there is no distinct line of riders. A large number of neolithic flints were found at 17° 12' N., 45° 55'·2 E. (Plate 6).

At the northern tip of the Sauda scarp, where it sinks into the desert floor, both floor and scarp are concealed by small south-west facing crescentic dunes 4–6 feet high. East of the Sauda the sands lie back as is the case with the Ardh scarp, but the six most southerly dunes of the sand desert approach to within 2 miles of the top of the scarp. North of them lies an area of sand sheet, the Bagheithan plain, with a few scattered dunes oriented in 250°. The plain may be traced some 20 miles east, and the dunes become more abundant and regular, until by 47° 45' E. the full pattern of parallel dunes with intervening *shiqaq* is redeveloped (Plate 7). The dune line about twentieth from the south was followed eastward from here (Plate 8). In 17° 50' N., 48° 10' E., there is a distinct change in orientation from 252° (to the west) to 244° (to the east), which may be correlated with a more gradual curve through the same range made by the dunes to the south near the Khashm al Jebel. The orientation of the riders is 10° greater than that of the dunes, and the slip faces to the south. For the next 80 miles east there is a series of minor direction changes always between 237° and 243°. In the area about 19° N., 50° E., the *shiqaq* floors become broken into windows by layers of sheet sand perpendicular to the general line of the dunes, and during the next 30 miles east these sheets take a more and more pronounced form till they become as high as the original dune lines, and the straight lines of *shiqaq* become confused in an area of reticulations.

A small area of dune massifs exists near the Khashm al Jebel, occupying the narrow triangle between the most southerly dune and the edge of the *jol*. The massifs lie on the nodes of a hexagon net and do not continue east of the mouth of the Wadi Hizar except for a few isolated examples known as "qa'id" on the gravel *jau*. The slip faces of all these massifs are to the south-west.

16: Gardner A-4 (1937-38) 1939 MM2 Hadhramaut MM2

help to introduce for the first time dating, absolute or relative, into the early 114 history, independently of, or in conjunction with, inscriptions. Interwoven 121 with these purely archaeological questions was Miss Gardner's geological investigation of the Quaternary physiography of the region; more especially inquiry into problems of past climates; and comparisons of Pleistocene conditions in South-west Arabia in lat. 15° N. with those of a typical desert area as studied by her in Kharga Oasis and elsewhere in the Libyan desert 10° farther north.[1] A recent Egyptian expedition under Dr. S. A. Huzayyin had done valuable work on these lines in 1936 in the Yemen, where a series of prehistoric pluvial periods had been traced, besides the possibility of a minor one in historic times. That expedition paid also a flying visit to the Hadhramaut, but little work was done there.[2]


48
50
16
14
KATHIRI
HADHRAMAUT
QU'AITI
Husn al 'Abr
Tarim
Shibam
Seiyun
Sune
Wadi Hadhramaut
Wadi Maseila
Reida
Hureidha
Meshhed
Shabwa
W. 'Amd
W. Du'an
W. 'Adim
REIDAT AL MA'ARA
Shihr
Mukalla
GULF OF ADEN
W. Hajr
Azzan
W. Meifa'a
Balhaf
Miles
20 0 20 40

131
133

The general physical features of the country are well known from the excellent map published by von Wissmann in 1932,[3] and from the air reconnaissance of Squadron-Leader Cochrane [4] and the late Flight-Lieut. A. R. M. Rickards, whose map shows well the peculiar drainage system (Plate 1). Very recently a methodical aerial survey of the whole Protectorate has been accomplished, and we are privileged here to publish some of the photographs. Mr. and Mrs. Ingrams still remain the only Europeans who have travelled from 114

---

[1] *Geol. Mag.*, vol. lxix, September 1932, "Some problems of the Pleistocene hydrography of Kharga Oasis." 113

[2] S. A. Huzayyin, "Egyptian University Scientific Expedition to south-west Arabia," *Nature* 140 (1937) 513–4.

[3] Folder to 'Hadramaut: some of its mysteries unveiled,' by D. Van der Meulen and H. von Wissmann. Leiden, 1932.

[4] "An air reconnaissance of the Hadhramaut" (*Geogr. J.* 77 (1931) 209–16).

114 end to end of the Wadi Hadhramaut, and accounts of their journeys have been given to the Society.[1]

The geological work

133 The geology of the coastal region around Mukalla has been described by Mr. O. H. Little, of the Egyptian Geological Survey, and those interested in the solid geology are referred to his paper.[2] This region is the most diversified both structurally and petrologically. The fundamental granite appears here overlaid by limestones of Cretaceous and Tertiary age, and faults and folds are conspicuous even from the air. The few days at Mukalla were spent in a rapid examination of the more recent geological features.

To the visitor by sea the most striking is the glistening bank of white dune-sand west of the town, probably masking a raised beach. The coast eastwards to Shihr is fringed with the remnants of a low-lying raised beach now being eroded. In the wadi immediately west of Mukalla a raised beach was noted at RL 15 m. about 1·5 km. from the shore. It consisted of semi-angular and partly rounded pebbles of granite and limestone with marine fossils. Four metres higher a second level of cellular sandstone may be either beach or river terrace.[3]

[487] After the Shihr road has passed through the coastal barrier backing Mukalla, it runs for 2 km. over an extensive gravel plain which slopes smoothly and evenly from RL 66 to RL 38 m. It then climbs a prominent ridge at RL 52·5 m., with a typical gravel profile, and descends again to a similar gravel plain. This plain is the most important erosional feature of the district: its age could not be determined exactly, but that it is Pleistocene seems fairly certain from the occurrence of palaeolithic flake implements of chert[4] on a narrow gravel ridge which rises from it near the fork of the Du'an road. This ridge lies 4 m. above the plain, and seems to be the last remnant of a more extensive level that has been destroyed by the lateral erosion of the two neighbouring wadis. These wadis bound the main plain north and south, and good gravel sections were examined in their banks, without however the discovery of flint implements *in situ* in them.

A line of levels was run from the Shihr road S.S.E. across the gravel plain towards the sea. The sketch-map and section, Fig. 1, show the principal results. The big erosional plain falls in this direction from RL 38 to RL 27 m. in 1100 m. It is then cut by the westerly wadi whose floor lies at RL 13 m. On the far side two terraces, one at RL 16 m. and a more extensive one at RL 20 m., are crossed before the gravel plain is regained at RL 22. From there it stretches for 500 m. or so seaward, and ends in a scarp feature at RL 19. It overlooks a marine terrace crowded with recent shells. Upstream these become scarcer and eventually die out, and the levels show that it is

---

113 [1] "A journey to the Sei'ar country and through the Wadi Maseila" (*Geogr. J.* 88 (1936) 524–51); "The Hadhramaut: present and future" (*Geogr. J.* 92 (1938) 289–312). See also *Journal R. Central Asian Society*, July 1936.

[2] O. H. Little, "The geography and geology of Makalla" (Geological Survey of Egypt, Cairo, 1925).

[3] Near Jibuti, which we visited on the way home *via* Hodeidah, Jeddah, and Yenbo, raised coral beaches have been recorded at RL 18 and 25 m.

[4] These resemble typologically the flakes called Levalloisian in N.W. Europe.

133

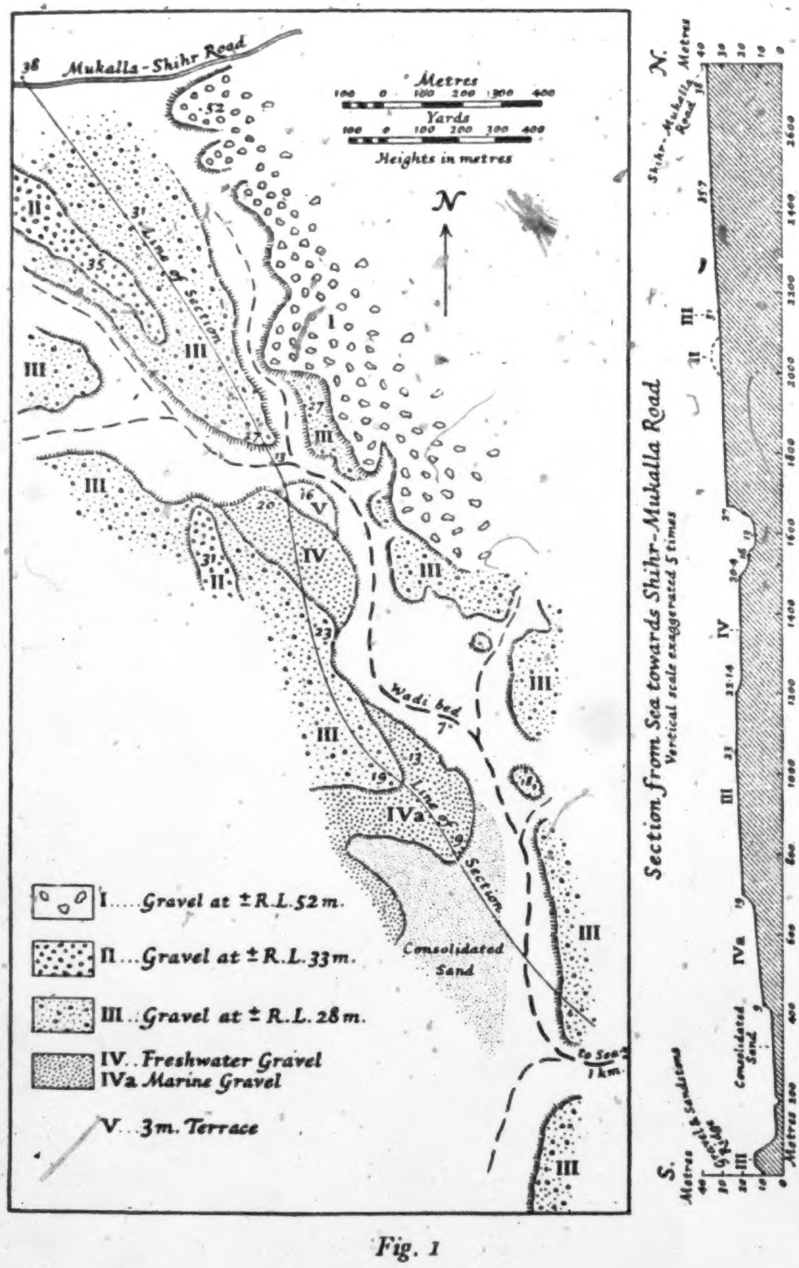

Mukalla-Shihr Road
38
Metres
100 0 100 200 300 400
Yards
100 0 100 200 300 400
Heights in metres
N
52
I
II
III
IV
IVa
V
31
35
27
17
13
16
20
23
19
9
7
Line of Section
Wadi bed
Consolidated Sand
to Sea 1 km.
I....Gravel at ± R.L. 52 m.
II...Gravel at ± R.L. 33 m.
III..Gravel at ± R.L. 28 m.
IV..Freshwater Gravel
IVa Marine Gravel
V..3 m. Terrace
Section from Sea towards Shihr-Mukalla Road
Vertical scale exaggerated 5 times
S.
N.
Metres
Shihr-Mukalla Road 38
Consolidated Sand
Gravel & Sandstone

Fig. 1

P. 21

133 the seaward end of the 16 m. terrace already mentioned. It slopes from about RL 15 beneath the higher plain to RL 12. Here it ends in a scarp about 2 m. high, and below it a consolidated yellow sand forms the wadi floor. The channel here turns and breaks through a ridge to the sea. This ridge is composed of cellular sandstone similar in appearance to that seen near Mukalla and, in some places, of gravels. From its level it would seem to be the last remnant of the big erosional plain on the east side of the wadi.

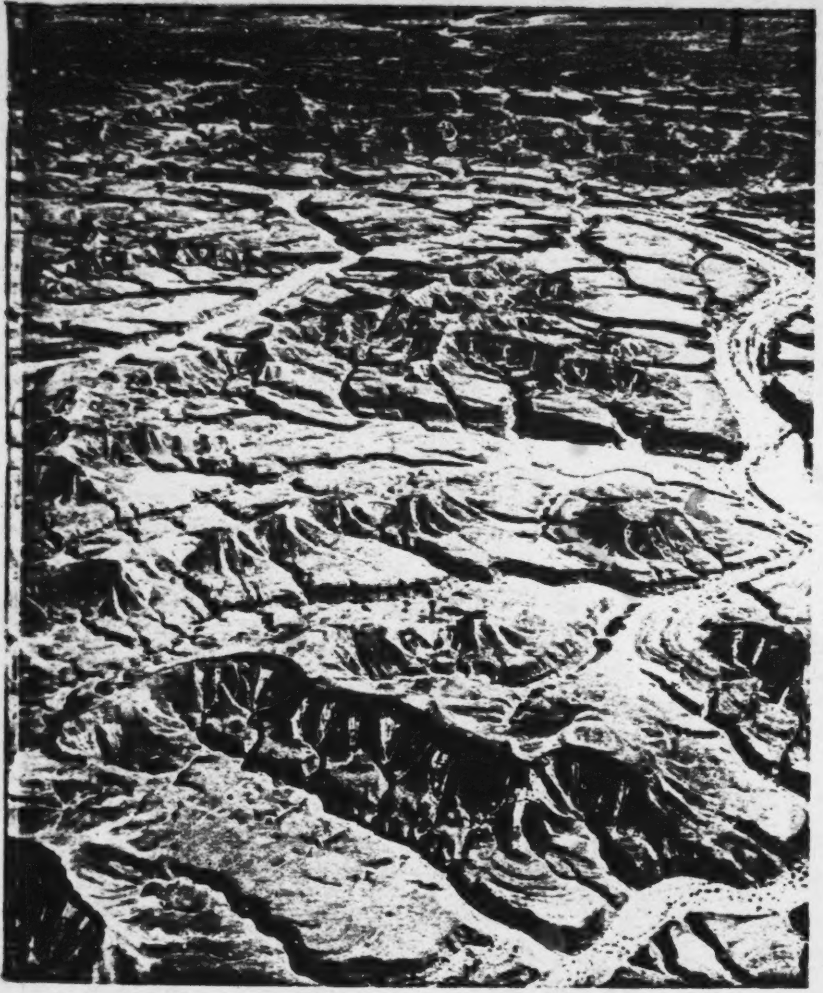
We have then in this area three well-defined levels and a minor one. These in order of age are: high-level gravel, RL 52 m., possibly Tertiary or early Pleistocene; remnant of erosional level, about RL 32 m., with palaeolithic chert implements on surface; extensive and important erosional plain, about RL 28 m., no sign of marine deposits passing downstream; terrace at 7 m.–5 m. above wadi floor at RL 16 m.; and a terrace at 3 m. above wadi floor.

[487] The road to Shihr continues along the coastal plain, crossing marine beds in many places, and runs over an extensive development of gravel just before reaching the town.

The coastal plain is here some 10–12 km. broad, and is backed by the great
cliffs and outliers of the South Arabian plateau, called the *jol*. It is some
[132 1000 m. high, but slopes gradually northwards up to 3000 m., becoming ever
427] more barren as it recedes from the influence of the monsoon rains. The
newly made road to Tarim follows a switch-back course over it, now crossing
stony plateaux, then descending into broad flat-bottomed wadis often sand-
covered and with lines of trees and scrub marking the watercourses. In
134 these wadis a loess-like deposit that was later to become such a familiar and
prehistorically important feature in the Wadi Hadhramaut and its tributaries,
was first seen. Here, as there, it seems to have filled the valleys through which
later erosion has carved a way. Near the village of Reida, in the Ma'ara
country about 60 km. from the southern edge of the plateau, rounded con-
solidated gravel and conglomerate were seen near a water-hole.

133 The watershed between the north and south-running valleys lies much nearer the southern than the northern edge of the plateau; this is possibly due to subsidence of the coastal area, and as a consequence many of the wadis draining into the Wadi Hadhramaut are very long. Nearing the edge of this great wadi the character of the drainage changes; instead of broad flat-bottomed valleys, there are narrow ravines deeply entrenched in the limestone (Plate 4). On the stony ground between them numerous deeply patinated palaeoliths, both cores and flakes, were found, similar in type to others whose occurrence *in situ* in gravel terraces of the valley floor system will be described later. Their position here, on tongues of plateau furrowed by deep ravines, recalled the occurrence of typologically similar implements on similar tongues of plateau licking the cliff edge of the Nile valley.

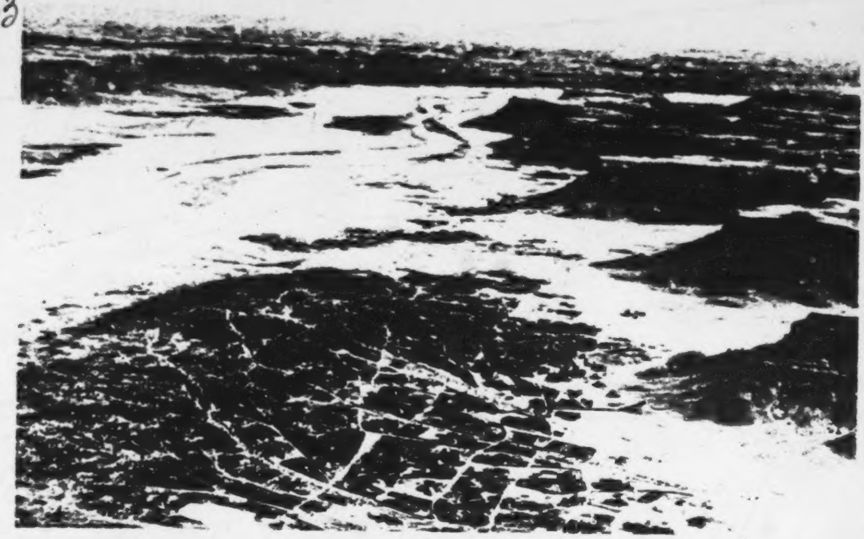
We first saw the Wadi Hadhramaut from the top of the pass leading sharply down to Tarim. It is a great flat-floored trench some 3 km. broad and 300 m. deep, bounded by high cliffs of characteristic outline, which repeats itself with monotonous regularity both along the main wadi and in the tributary valleys. This outline is the expression of the geological features, which are here very simple (Plates 2, 3). The cliffs consist of a series of almost horizontal beds; the upper 200 m. are of limestone, Eocene over Cretaceous.



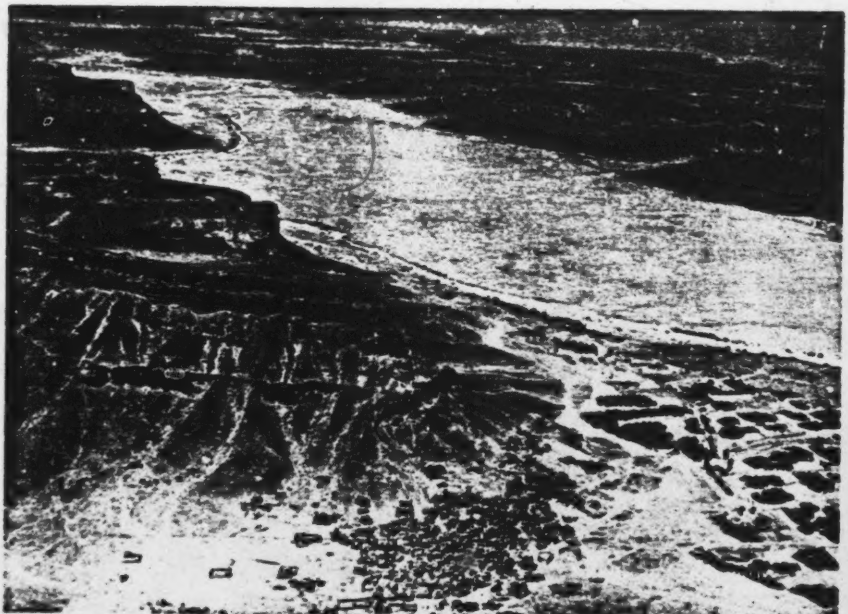
1. The Hadhramaut: entrenched drainage and characteristic denudation

Facing P. 22 (A)

133



2. *Wadi Hadhramaut at Seiyun, looking down the valley*



3. *Wadi 'Amd at Hureidha*

Facing P. 22 (B)

133 The Cretaceous bed is particularly massive and juts out beyond the overlying strata to form bold headlands between the lateral wadis. The more gentle slope below to the wadi floor is due to soft red sandstones, with occasional shaly layers towards the top. They are probably the local representatives of the Nubian sandstone. Owing to their softness they are being eroded rapidly and consequent undercutting of the superposed limestone causes huge falls of rock. The result is a thick mantle of scree, consolidated in places to a breccia which almost hides the sandstones. The formation of this scree must have begun far back in the wadi's history, for not only have the talus slopes been cut into "semi-detached" hillocks, but they appear to plunge under the valley filling. Numbers of chert implements of Levallois type lie in and on the scree and argue a *status quo* as far back as the middle [172] or later Pleistocene. In historic times also these screes and breccias were put to practical use, for tomb entrances of the pre-Islamic inhabitants of these valleys were cut through them, and sepulchral caves hollowed out in the soft sandstone slopes beneath.

Travelling along the main wadi and up its tributaries, the beds in the bounding cliffs appear to remain at a constant level above the wadi floor. The strata cannot therefore be truly horizontal, but must rise gradually both west and south. To one used to the valley systems of Egypt a striking feature of the Wadi Hadhramaut is the monotonous flatness and uniformity of its floor (Plate 3). No great prehistoric gravel terraces mark higher water-levels, and the present flood-channel or "*seil*-bed" is a relatively insignificant feature. Obviously the most important episode in the wadi's history, after its actual cutting, was the deposition of material which filled it and its tributaries to some unplumbed depth. The upper part of this fill is a fine sandy silt, which will be described later, but there is reason to believe that gravels underlie it, for farther down the main wadi they come to light. Moreover in the Wadi 'Adim, an important tributary coming in from the south near Tarim, the 15-m. section of the wadi bank shows 4–8 m. of silt overlying thick gravel bands (Plate 5). These gravels fade out before the mouth of the wadi is reached, and have presumably plunged deeply down and may join similar deposits in the main valley.

The Wadi Hadhramaut shows a curious reversal of the normal valley form in being wider towards the source than the mouth. In the narrower stretch below Tarim, known as the Wadi Maseila, Mr. and Mrs. Ingrams found lava-flows which, it has been suggested, may once have blocked the course. Air photographs show the position of this lava, but have not conclusively corroborated the idea. The narrowing, moreover, begins before this point for no apparent petrological reason, and the cause more probably lies in the wadi's history, and is conceivably due to complicated river capture. Unfortunately time and tribal conditions prevented an examination of this area.

[361] All the detailed work of the expedition was done from the small town of Hureidha in the Wadi 'Amd, 24 km. from its junction with the Wadi Hadhramaut. Here one of the most important tributary systems enters from the south. It consists of two big valleys which divide, 10 km. from their common outlet, into the Wadi Du'an running due south for 80 km., and the Wadi 'Amd running south-south-west for over 120 km. Near the junction of the

16: Gardner A-4 (1937-38) 1939 MM2 Hadhramaut MM2

172
●133
134
312

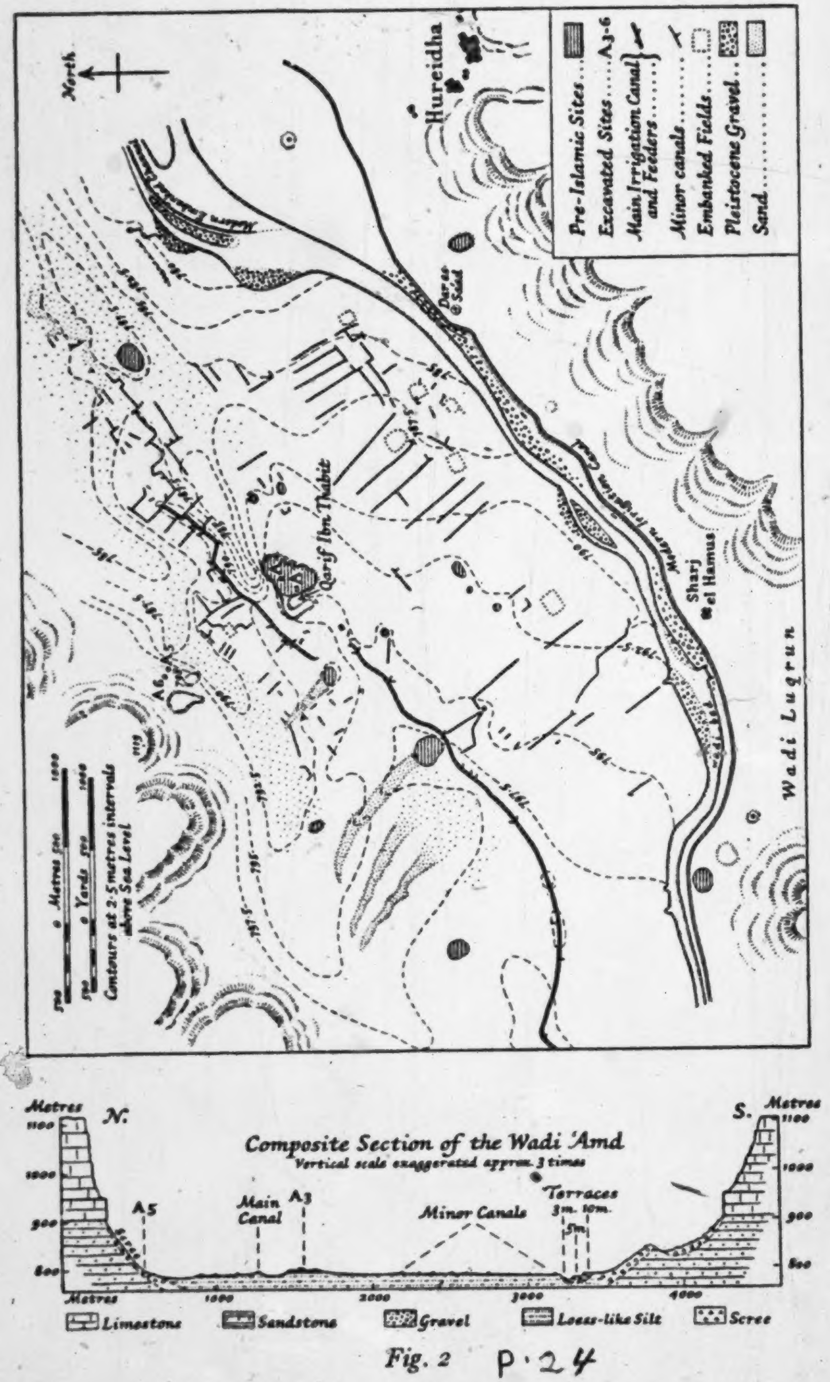

North
Metres 500 0 500 1000
Yards 500 0 500 1000
Contours at 2·5 metres intervals above Sea Level
Hureidha
Qarif Ibn Thabit
A6
A5
Dar es Saad
Sharj el Hamus
Modern Irrigation Canal
Wadi bed
Wadi Luqrun
Modern Embanked Channel
795
797·5
792·5
790
785
Pre-Islamic Sites
Excavated Sites A3-6
Main Irrigation Canal and Feeders
Minor canals
Embanked Fields
Pleistocene Gravel
Sand
Composite Section of the Wadi 'Amd
Vertical scale exaggerated approx. 3 times
Metres
N.
S.
1100
1000
900
800
A5
Main Canal
A3
Minor Canals
Terraces
3m.
5m.
10m.
Metres
1000
2000
3000
4000
Limestone
Sandstone
Gravel
Loess-like Silt
Scree

Fig. 2 P·24

two great wadis the silty deposit, which we propose to name "aeolian silt," 133
has been eroded into hillocks reminiscent of those on the floor of Kharga Oasis, except that they are larger and not so stream-lined by wind. The subordinance of wind erosion in the Hadhramaut is in striking contrast to conditions in Kharga, and emphasizes the difference between a true desert-belt and one under the influence, however incompletely, of the monsoons.

The work around Hureidha consisted of the examination of the geologically recent deposits, and the detailed mapping of a small area around the ruin field (Fig. 2). The section, Fig. 2, shows that the structure of the valley is the same as that in the Wadi Hadhramaut.

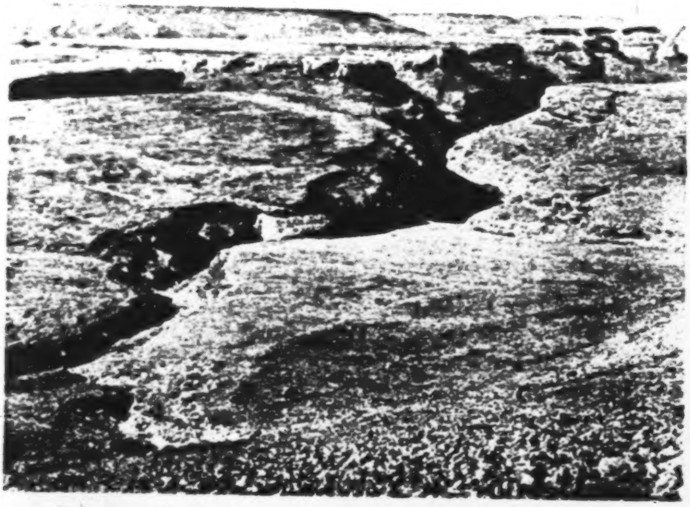
The valley filling is the dominant deposit. It is on the whole a fine-grained 134
material, largely arenaceous but with a certain amount of clay. Structurally it shows the prominent vertical jointing so characteristic of loess and aeolian deposits in general. Yet this is not the only guide to its origin, for clay bands and occasional scattered lines of pebbles point also to water action. It seems therefore convenient to use the term "aeolian silt" for this deposit to represent its composite character, part wind, part water-laid. Water action would seem to have played a greater rôle here than in Kharga, where wind bedding, absent in the Hadhramaut, is common. A good section was examined in the banks of the flood channel north of Hureidha (Plate 6). Two darker banks can be seen running nearly horizontally 1 and 2 m. from the top of the section. These are formed of more argillaceous material, and clay balls were common in the sandy layers. Here and there a pocket of land shells lying at all angles was found. These were mostly *Zootecus insularis* Ehrn, but a few *Obeliscella bentiae* M. and P. and *Pupoides* sp. also occurred. The full depth of the filling could nowhere be ascertained. The wells in the floor of the Wadi Hadhramaut are shallow, and in the Wadi 'Amd, though very deep,[1] they are in the rising sides of the valley. In discussing the age of the aeolian silt we can therefore speak only of the upper layers.

In the Wadi 'Amd good dating evidence was obtained in the north bank of 133
the flood channel opposite the Wadi Luqrun, a tributary wadi entering from
the south near the village of Sharj el Hamus (see Fig. 2). Here a magnificent 134
section is exposed in a cliff 10–8 m. high (Plate 7). It is capped by four or more 172
metres of aeolian silt which stretches away northwards and forms the whole floor of Wadi 'Amd. This is underlaid by two gravel bands separated by more aeolian silt, which in turn underlies the lowest gravel and forms the floor of the flood channel. The gravel bands are about 1·5 m. thick, and consist of medium to small limestone pebbles with occasional ones of chert or tufa. Both bands contain chert implements but they are particularly abundant in the lower. In the sides of the erosion channels the gravels are seen to tail out northwards and eventually disappear. They obviously represent the outwash fans of the Wadi Luqrun, which seems to have been capable of carrying gravels while the main wadi was bringing down silt only. The tools in these gravels are of Levalloisian flake type, and date the uppermost layers of silt in the Wadi 'Amd. Confirmation was obtained by finding a good unworn tortoise core embedded in the silt at another spot.

---

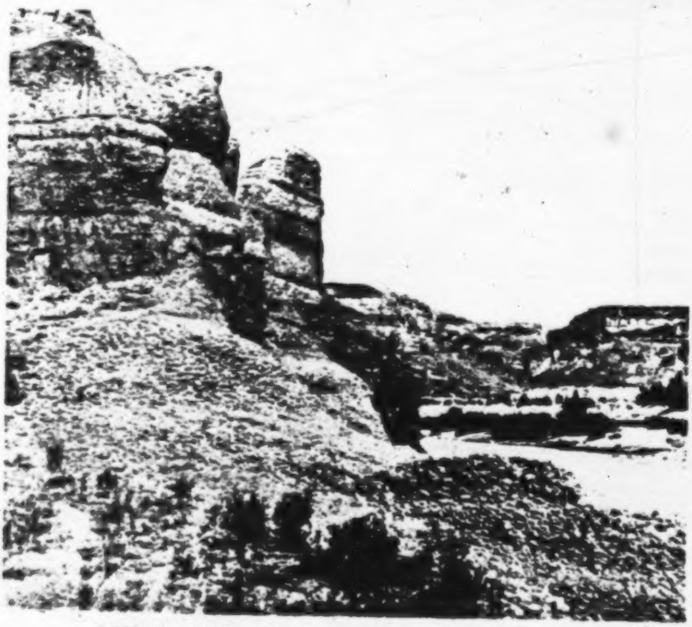
[1] Van der Meulen and von Wissmann state (*op. cit.*, p. 98) that some are about 300 feet deep.

● 133



4. *Jol above Tarim: palaeolithic area at the head of lateral wadi*

134
13·3



5. *Wadi 'Adim: exposure of aeolian silt over gravel*

Facing P. 26 (A)

134 rainfall, represented by the gravel terraces. But this sequence might also be due to other causes such, for instance, as the blocking of the Wadi Hadhramaut by the lava-flows, and therefore it was necessary to look for independent evidence. Von Wissmann observed that the plains of the Yemen are floored with a great layer of fine sandy soil, aeolian in origin and very similar to loess.[1] This in a neighbouring country lends support to the climatic origin of the changes. Reinforcement comes also from the occurrence of aeolian silt, already mentioned, in the wadis of the *jol* far removed from the influence of the Wadi Hadhramaut. Further support on other lines was also obtained in the Wadi 'Amd itself, during the examination of small lateral wadis.

133 Some of these minor lateral wadis and ravines have springs trickling from the base of the big Cretaceous cliff, and it seemed possible that if a period of greater rainfall had, as surmised, occurred in the past, evidence would be registered in the formerly more abundant flow of these springs. In Kharga Oasis few springs still exist on the scarp, but we found there conclusive proof of more abundant water in the Pleistocene. This was demonstrated by the great deposits of travertine or tufa which in places completely mask the underlying rocks. In the Hadhramaut ancient tufa was found near the existing springs, and as terraces in the ravines above them, but developed on a far smaller scale than in Kharga (Plate 9). This may be due partly to the difference in configuration, and partly to the monsoon erosion in the Hadhramaut. Its occurrence does however point to a time of greater rainfall and spring activity. But, though on a smaller scale, the Arabian tufa deposits are strikingly like those of Kharga in their general aspect. In both places they have weathered to a rusty brown-black with a light yellow fracture, and in both places massive and cellular types occur, though nothing resembling the "plateau" tufa of Kharga was found. They all belonged to the "wadi" type.[2]

The deposit in both places contains fossil leaves, amongst which fig leaves are predominant, and shells, though these are unexpectedly much more abundant in Kharga than in the Hadhramaut. Moreover in Arabia the tufas were not, in the areas examined, associated with interbedded silts and gravels, as in Kharga, nor were palaeoliths, as there, *in situ* in them. The dating of the Kharga tufas in archaeological terms is therefore much more definite and susceptible of subdivisions than in Hadhramaut; but the palaeolithic age also of the latter is placed beyond doubt by the occurrence of tufa pebbles in the 10-m. gravel terrace, and in the gravels interbedded with the aeolian silt.

A typical spring and tufa terrace outcrop in Arabia may now be described for the first time.

The modern springs issue in lateral ravines at or near the base of the massive lowest Cretaceous limestone, which is undercut sometimes by as much as 20 or 30 m. A good example was found in a small valley on the west side of the Wadi Luqrun, where two trickles of water come from cracks in the limestone about 1·5 m. above its base. A soft spongy mass of recently formed

---

113 [1] C. Rathjens and H. von Wissmann, "Vorislamische Altertümer" (*Südarabien-Reise*, Band 2, 1932, p. 14).

[2] For discussion of these tufas see Caton-Thompson and Gardner, "The prehistoric geography of Kharga Oasis" (*Geogr. J.* 80 (1932) 369–409), and Gardner, "Some problems of the Pleistocene hydrography of Kharga Oasis" (*Geol. Mag.*, vol. lxix, September 1932).

133 tufa surrounds, and almost blocks, the outlet, and forms a small fan below.
In one case a narrow channel has been humanly cut in the deposit to lead the
water into a cement tank from which periodically a few palms are watered.
137 The surplus water overflows and is lost in the scree. Growing amongst the
huge boulders are shrubs and trees, wild figs, *Ficus salicifolia*, and *F. sycamorus*
being particularly common. Around the water itself maiden-hair fern and
other small plants make a pleasant green garden in the rocky desolation.

133 At this level there is a limestone platform or shelf some 10–11 m. wide, and on the edge of this occur the outcrops of Pleistocene tufa. In the Wadi Luqrun it is a block 5 m. thick and 3–4 m. high, which is evidently but a remnant of a much more extensive deposit, for traces were detected on the walls of the great limestone overhang. Its present size and isolation are some measure of the time that has elapsed since its formation. A few badly preserved fossil leaves were found here, but also a considerable number of small cavities which, as in Kharga, are the moulds of fruits. Most of these show no structure and are therefore unidentifiable, but Mrs. E. R. Reid, who kindly examined them, found one that was certainly a fruit of a species of *Celtis*.

A climb of 50 m. or so up the scree slope to the top of the Cretaceous lime-
stone leads over bare rock to the upper course of the wadi. In time of spate
the waters must cascade in a fall over the lip. At Luqrun traces only of tufa
occurred at this upper level, but in a valley east of Hureidha a much larger
outcrop was found which yielded many leaves. Here, after half an hour's
ride along the wadi floor, the track climbs gradually up the stony scree slope
to the top of the Cretaceous limestone. A hundred metres or so from the edge
a mass of tufa occurs as a terrace remnant 15–16 m. above the limestone floor.
It is 4·6 m. high and rests on limestone breccia. This outcrop was particularly
137 rich in leaves. The commonest types closely resemble figs, but without the
fruits this identification cannot be assured. Some however seem identical with
the *Ficus sycamorus* leaves found in the Kharga tufas,[1] and another resembles
F. salicifolia; as both trees are still growing nearby they probably occur as
fossils. Some kind of palm is certainly present and one or two other unidenti-
fied types. The shells are scarce and not well preserved. *Melania tuberculata*,
Zootecus insularis, and a *Planorbis* were present. More abundant is the cast of
a lava very similar in appearance to that found in Kharga and considered
by Dr. Zeuner to be that of a dipterous insect.

103 The pool at the foot of the cliff was examined. It is called "El Bahr"—the
529 sea[2]—and is a favourite bathing-place, the Badawin climbing the cliff and
823 diving in from a considerable height. Local tradition calls it bottomless, and
a weighted tape failed to touch bottom at 19 m. It would seem to be a super
133 pot-hole, ground out through the ages by the swirling stones and water of
the seasonal cascade from higher levels. It is in the shade for most of the day,
and water remains all the year. The shallows around are covered with soft

---

113 [1] Gardner, "The Pleistocene fauna and flora of Kharga Oasis" (*Quart. J. geol. Soc.*, vol. xci, December 1935.)

[2] Van der Meulen and von Wissmann in 'Hadramaut: some of its mysteries unveiled' describe this place. "After energetic scrambling over fields of stone and up slopes of rock we actually arrive at El Bahr, a deep, rocky basin, full of water, with high cavernous walls, from which, after rain, the water must fall in spray into the basin."

muddy tufa still being deposited. No living thing was seen in the pool, but 133 dead shells of *Bulinus*, probably *truncatus*, were collected from the muddy edge. They are small and distorted, probably owing to the excess of lime.

In a wadi still farther up the lateral valley, the Wadi Sam'ua, a series of pools occurs at the foot of successive steps in the ravine bed above the Cretaceous limestone. These pools were not so deep as El Bahr and had abundant [136] life: fish, frogs, beetles were all seen, and two univalves (a *Planorbis* and a new species of *Ancylus*).[1] The wadi narrows to a steep-sided ravine in its upper reaches; yet clinging to the side above the first pool was a mass of tufa 4 m. high. Other pools, backed by tufa cliffs with suspended stalactites, lie at still higher levels. Here exploration had to stop, but enough had been seen to establish the interest of the terrace tufa in these upper reaches.

From the above account it may be deduced that the main events in the wadi's history are as follows:

Major erosional phase, when the great Wadi Hadhramaut and its main tributaries were cut. This in all probability took place in stages. From the amount of erosion and the many changes in the wadi since its development, the time of cutting must be at least as early as late Tertiary or early Pleistocene, and may well be far older. It cannot, as has been suggested, be synchronous with the Glacial Age in Europe.

Major depositional phase, also probably subdivided into minor episodes. The valleys were filled to some unknown depth with deposits. The upper part of these is aeolian silt of palaeolithic age, which is known to overlie gravel in some areas. In the lateral wadis tufa formation had begun.

Minor erosional phase, represented by the cutting of the aeolian silt and deposition of gravel in place of silt. This can be subdivided into three parts, the 10, 5, and 3-m. terraces, also of palaeolithic age. The flood channel then followed the same restricted course as now.

It is interesting to note that these three main phases were traced in Kharga Oasis; but there, the evidence being more complete and varied, and the time of study far longer, they could be subdivided and dated with more certainty than in the Hadhramaut. No sign of a historic pluvial was seen in that part of the country which we examined.

Archaeological notes

Quaternary palaeoliths have, in the foregoing pages, been noted: on the 133 Mukalla gravel plain; on the spurs of the *jol* near the south edge overlooking 172 the Wadi Hadhramaut above Tarim, in positions recalling their distribution on desert cliffs overlooking the Nile valley; on and in cliff screes of the Wadis Hadhramaut and 'Amd; and in the 10, 5, and 3-m. gravel terraces of the Wadi 'Amd near Hureidha, and in the somewhat earlier aeolian silt of the valley's main filling. These discoveries of palaeoliths were no novelty, for Mr. and Mrs. Ingrams had already noted them in many places,[2] but they had not, I believe, been previously found in geological deposits. Nor must our restricted 172

---

[1] All shells from the Hadhramaut have been given to the British Museum. Major Connolly is kindly identifying them and will publish the results in his forthcoming work on the shells of the Yemen collected by Dr. Scott, of the British Museum.

[2] *Geogr. J.* 92 (1938) 306.

A crude flake-industry of Levalloisian type belonging to the second class

mentioned above would seem alone to represent palaeolithic man in the Hadhramaut, where it was free from the development which in N.W. Europe has necessitated seven subdivisions. The earliest appearance we could trace was *in situ* near the top of the aeolian silt of the Wadi ʻAmd infilling. In chronological succession follow the 10, 5, and 3-m. gravel terraces laid in a stream-bed cut in this silt. The scarce contents of the 3-m. terrace are derived from the two higher ones, which however show no variation in type *inter se*. 172 138

Eventual discovery of the palaeolithic contents of the older, deeply buried silt levels and gravels would be of great interest; but we may risk already the conclusion that the flake industry found *in situ* continued, isolated and unchanged, throughout a very long geological period, which we tapped at only one or two points. It would be rash on existing evidence to place its probable position in the Pleistocene, though it may well prove to lie in the middle: typology alone is insufficient, and archaeological stratigraphy will need first to be established in cave or man-favoured geological deposit, if such exist, and our failure to find a single fossil animal bone in the gravels rectified.

So much for the first of the archaeological objectives. The second of them —namely contacts with the chalcolithic east—drew a complete blank. I 172 myself found, was shown by natives, or observed in the miscellaneous antiquities gathered together in Aden no single object which indicated any such early contacts with the Hadhramaut. Of later antiquities however there was no scarcity. Though the Wadi Hadhramaut itself in the stretch examined around Tarim, Seiyun, and Shibam yielded little except rock graffiti pecked in South Arabian characters, and accompanying animal engravings in restricted numbers, the major lateral wadis seem to offer better prospects to the excavator.

The fairly extensive pre-Islamic ruins at Sune in the Wadi ʻAdim were visited for a few hours from Tarim, and sherds and other samples collected from the surface for comparison later with more westerly sites. Here too were lying numbers of the microlithic obsidian flakes in geometric forms—trapezoids, triangles, rectangles, and crescents, neatly retouched on their lateral edges—which Miss Stark had also collected in 1935 on the ruin-field of Gheibun near Meshhed in the Wadi Duʻan, and had kindly shown to me.[1] I had then recognized their kinship with the latest microlithic obsidian industries in Kenya, and was prepared, in the absence of the necessary corroborative evidence from other archaeological factors, for a date considerably earlier—possibly in the second millennium—than anything hitherto known from the ruins of the old South Arabian kingdoms. Their occurrence also at Sune, amongst the dusty rubble heaps of the stone-built ruins, though suggestive of true contemporaneity could not, without excavations, be conclusive.[2] Any doubts there might be vanished later at Hureidha in the Wadi ʻAmd, where my excavations of a pre-Islamic temple and its contemporary tombs, no part of which could be earlier than about the sixth century B.C. and which were mainly or entirely some centuries later, established beyond question the

---

[1] 'The southern gates of Arabia,' p. 166. Mr. and Mrs. Ingrams had also collected them there in 1934 (*Geogr. J.* 88 (1936) 524–51), but not, I think, the crucial types.

[2] Dr. Huzayyin in 1936 also collected these obsidian tools at Gheibun, and felt assured their date was that of the ruins.

133

5m. terrace
10 m. terrace

8. *Terraces in Wadi ʻAmd*

9. *Wadi ʻAmd: tufa boulders in lateral wadi*

Facing P 34 (A)

21; Thomas T-5 (no date) 1932 MM2 Hadhramaut MH2

ANTHROPOLOGICAL OBSERVATIONS IN SOUTH ARABIA.

By Bertram Thomas, O.B.E.

[With Plates XI and XII.]

Introduction.

114 I have already been privileged to contribute a paper to the *Journal*.[1] "Among some unknown Tribes of South Arabia" was published after my first journey in those parts in January–February, 1928. Since then I have made two more visits to the Central South and have continued my investigations. On the last occasion I took head callipers, a small cinema camera and a still camera with me. I made some forty-five head measurements and took full-face and profile portraits of the various types I measured.

Curious Tribes.

144 174 In my previous paper I said that there was a *bloc* of tribes in the Central South that I believed to be non-Arab remainders, tribes at least who were physically, culturally, linguistically distinguishable from the familiar tall and hawk-faced Arab of the North. I am confirmed in that view. After an experience of fifteen years' service in Arabia, living on close terms of intimacy with its people in Mesopotamia, Trans-Jordan and the Persian Gulf, I am struck by the peculiarities of the inhabitants of the Central South. The Sultan of Muscat shared that opinion. I was not consciously aware at the time of the speculations of Richard Burton which also support it. That Arabian traveller had written in the middle of the last century (*vide* "Pilgrimage to Al Medina and Mecca")—

> "I was desirous to try by actual observation the truth of a theory proposed by Colonel Sykes, namely, that if tradition be true in the population of the vast peninsula there must exist certain physiological differences sufficient to warrant our questioning the common origin of the Arab family." . . . And later . . . "I have found proof . . . for believing in three distinct races, (1) the aborigines, driven into the Eastern and South-Eastern wilds, (2) a Syrian or Mesopotamian Stock that drove the indigenae from the choicest tracts of country . . . (3) an impure Syro-Egyptian clan . . ."

133 Before passing to a consideration of these strange tribes I lived amongst, it is necessary to say something about the land in which they live. The south coast of Arabia west of long. 55° (Ras Nus) is very mountainous and very wild. It is a natural asylum for early races driven before invaders. At Dhufar in the Central South, these mountains form a crescent-shaped arm which encloses a prosperous and fertile plain. To the westward the mountains form an

---

[1] Vol. lix, 1929, January to June, p. 97.

21: Thomas T-5 (no date) 1932 MM2 Hadhramaut MM2

● 133 ocean escarpment, but in the Hadhramaut they intrude for over 120 miles to the northwards. Beyond them and between them and the southern edge of the sands is a wedge-shaped plain narrowing westwards and falling from south to north and from west to east. The edge of the sands at Mugshin is about 490 ft., at Shisur about 935 ft., at Shuait 950 ft., and to the west not improbably rising to 2,000 ft. or more in the neighbourhood of the Najran. This plain is crossed by dry wadi beds, or what Burton calls "fiumura." They take their rise in ravines deeply eroded in the limestone of the mountains and they become more shallow as they run northwards, until, as they approach the sands, they are almost indistinguishable from the steppe in which they are merely shallow depressions marked here and there by scrub. These wadis [132] are the arteries of approach for Badus journeying from the mountains northwards. They are evidence of a very different climate from what now prevails, the deep gorges are doubtless the result of torrential rain action. To-day the country is extremely arid, and rainfall is slight or negligible.

Arabia is said never to have had an ice age, so that when the territories of the higher latitudes of the Northern Hemisphere lay beneath an ice cap, Arabia must have enjoyed a pluvial period, and it is from this time that these great gorges running northwards on the desert side of the South Arabia escarpment possibly date. I picked up many fossils on the edge of the sands, which must have been washed down in bygone ages. These were of limestone formation and have all been identified as belonging to the Middle Eocene period. The tradition of ancient trade routes across what is now almost a prohibitive barrier of sands, should not therefore be dismissed as unreasonable: it may connote that a very early civilization 172 existed in this region. Indeed caravan tracks of great antiquity were pointed out to me in 138 lat. 18° 30′, long. 52° on the very edge of the sands and leading on a bearing of 325° into what is now a drought-stricken waste of sands. The Badus called this "the road to Ubar," a town which they say lies buried, according to their tradition, beneath the sands that are ever encroaching southwards. Whether the words "Ubar" and "Ophir" have any sort of connection it is impossible to say, but the alleged site of this buried city is on a direct line from the frankincense country of Dhufar to the most probable site of Gerrha on the Persian Gulf, and to Petra in Nabathaea, the great marts of the classical geographers.

[171] Other archæological remains are the old ruined townships of the plain of Dhufar and the trilith monuments I discovered in the frankincense country just over the Divide.[1] The former would appear to preserve a link with ancient Abyssinia, for the characteristic architectural feature is a monolithic column which, according to Bent, is common to that area, but is nowhere found being made to-day in Arabia. As regards the significance of the trilith monument, accurate memory of it has faded from the tribal mind. This brings us to the inhabitants themselves.

101 The nomadic tribes living in the Southern Steppe are Bait Kathir, elements of the Mahra,
619 Manahil, Awamir, Sa'ar and Mashai (Bal'Ubaid). In the mountains in northern Hadhramaut
000 and the hinterland of Aden are two other interesting types, Hamumi and Yafi'i. With the

---

[1] For a detailed account see "Among Some Unknown Tribes of South Arabia," *Journ. Roy. Anthrop. Inst.*, vol. xiv, 1921, pp. 107 *seq.*

21; Thomas T-5 (no date) 1932 MM2 Hadhramaut MM2

Journal of the Royal Anthropological Institute, Vol. LXII, 1932, *Plate XI*

133
492

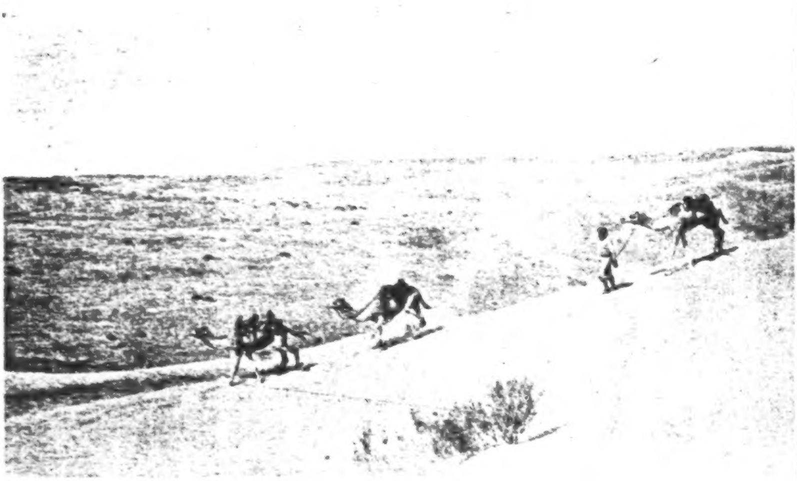


FIG. 1.—THE SANDS OF DAKAKA.

133

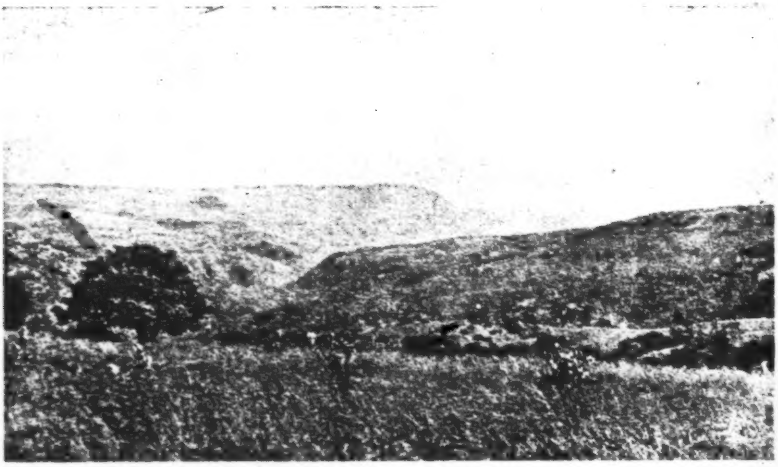


FIG. 2.—SOUTH ARABIA QARA MOUNTAINS. FUZAH. LOOKING DOWN OVER IR (W. ARBOT).

ANTHROPOLOGICAL OBSERVATIONS IN SOUTH ARABIA.

P. 104 (A)

22: Reilly G-3 (1933-41) 1941 MM2 Hadhramaut M

THE ADEN PROTECTORATE

By LIEUT.-COLONEL SIR BERNARD REILLY, K.C.M.G., C.I.E., O.B.E.

000 Lecture given to the Royal Central Asian Society on February 12, 1941, Sir Cosmo Parkinson, K.C.B., K.C.M.G., O.B.E., in the chair.

CHAIRMAN: We now come to the business of to-day, which is Sir Bernard Reilly's talk on the Aden Protectorate.

I could not help thinking, to go back to Lord Lloyd for a moment, how immensely interested he would have been in this talk, with his abiding memories of the Middle East, his intimate understanding of the Arab people, and his sincere respect for the faith and the tradition of Islam.

114 Sir Bernard Reilly needs no introduction. Any of you who have been to Aden, if only for a day, must know of him, because the two words "Aden" and "Reilly" are virtually synonymous. We have heard of "Reilly of Aden." I have sometimes wondered whether it should not be "Aden of Reilly." He has given a lifetime of service there, and, when the Aden Settlement was turned into a colony he became most appropriately the first Governor and Commander-in-Chief. If ever an administrator overseas deserved the title, "father and mother of the people," it was Sir Bernard Reilly in Aden.

000 There is just one thing I must tell you. When he was going away from Aden last year he did not know that he was retiring. When he reached this country he realized that private circumstances were such that he absolutely must retire, deeply as he regretted not going back to Aden. Before he left, his Arab servant, who had been with him many years, said: "Master, when the time comes for you finally to leave Aden, you must not tell us. You must go away, just as if you were taking one of your holidays to England, because the partings would be too sorrowful." That is a great tribute; and, in point of fact, on this occasion the master did act on the advice of the servant.

131
133 THE Aden Protectorate is an extensive tract of country in Southern Arabia. Its coast stretches from a point opposite to the island of Perim for about 600 miles to Ras Durbat Ali on the borders of Oman, and it reaches inland to a depth varying from about 100 miles in the vicinity of Aden to a greater but undefined distance farther east. Arabia is often thought of as a land of deserts, but this part of it, like many other parts, is a country of mountains. The sandy plain that the passing traveller sees stretching inland from Aden is only a maritime belt. Beyond it the hills rise abruptly in peaks and ranges that reach to heights of 8,000 feet and more. These mountains are, for the most part, rugged and forbidding, but they are interspersed by valleys and ravines that contain fertile and cultivated
000 strips of land. Where the slopes permit, the sides of the hills are

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

green. The eyebrows are shaven off and a finer line is painted 301
in. The hair is shaven off all round the edge and greased 302
stiff and pasted against the skull. All sorts of variations in the use of the above-mentioned aids to beauty are possible. To our taste the result is often more than ugly, not to say terrifying.

Never again were we received with so much friendliness and 609
with so little prejudice by Bedouin women. On later occasions they generally ran away screaming at our approach or hurled furious invectives at us. The people of this Ḥaiqī tribe seemed to know so little about their own religion that they were not yet infected with prejudice against *Naṣrānīs*.

Close to this camp the R.A.F. from Aden have made a 508
landing ground for forced landings. The corners and the centre are marked out by broad lines of chalk. The big aerodrome is on the coast near Fūwa, about three hours South-west of Makalla, and somewhere in the neighbourhood there is said to be a third one.

On the coral terraces grow jathropha and in the depressions 137
aerva, a little bohar, and also incense bushes. There were 136
swarms of young yellow grasshoppers all over the bare rocky 139
ground. The path runs downwards towards a wādī, where fresh water from the Ghēl Bā Wazīr and salt water from the sea meet and mingle.

The village of Sheḥēr lies on the further shore and is said 361
to have 1500 inhabitants, who live in mud huts. In a prominent [342]
position above it stands the chieftain's house, which is, at the 622
same time, the villagers' fortress for defence against attack. 712
A couple of rusted cannon lie on the terrace in front of the house. There are loop-holes on every floor in the thick mud walls and the window openings are small. Shēkh Elmās is 342
to be our host: he receives us in a friendly way in his *madjlis*[1], 574
and, at our request, is at once ready to have quarters prepared for us on the roof, but we have to wait till the women

---

[1] *Madjlis* (مجلس), lit.: "the place where one sits", and has come 104
to mean: the reception-room, meeting, or company.

342 have moved out to make room for us and the way is quite
574 clear. Our host himself makes an inspection, to make sure that the feminine inhabitants are shut in behind closed doors before we are invited to follow him upstairs. It is glorious on the roof. We are free there from vermin, and mosquitoes, also, do not seem to come.

We beg urgently that no sheep be killed for us. It is difficult to persuade our generous host to accede to our unusual request, but he does at last realize that we have more desire for tea and fruit. A tray with glasses of tea is brought up to us and a second one with slices of melon, fresh figs, dates and sweets. Shēkh Elmās has seen something of the world; he is related to the Sultan's family and is not without a trace of Indian blood. His brother, the *ʿāmil*[1] of Ghēl Bā Wazīr, the headquarters for the cultivation of the celebrated Ḥumūmī tobacco, is staying with him and gives us a pressing invitation to visit that prosperous and beautiful bit of Arabia. We promised to try and touch at Ghēl Bā Wazīr on our return journey.

5. AN EXCURSION TO GHĒL BĀ WAZĪR.

000 Our way back to the coast from Terīm was so planned that we were unable to keep our promise to our host's brother. Yet we *did* visit Ghēl Bā Wazīr, but not until after our return to Makalla, when we had to wait several days for our boat to Aden. On June 24th we started for Ghēl Bā Wazīr, via Sheḥēr, in a car placed at our disposal, as before, by the Vizier of Makalla, Sayyid Abū Bakr el-Miḥḍār.

133
361 Behind the plateaus of coral formation along the coast is a shallow, extensive loess basin which is watered by a little stream, the Ghēl, having its source in the mountains lying behind the coast terraces. This basin with the strip of land suitable for irrigation, which lies by the banks of the Ghēl, is the chief area for the cultivation of the famous Ḥumūmī tobacco. The little town, which guards the entrance

---

104 [1] *ʿĀmil* (عامل), governor.

to this rich domain, lies at the edge of the plateau of coral 133
stone. As one approaches from the coast one barely sees the 361
gardens of palms; soon one finds oneself in front of a high, white wall, with a great, fortified gate, which, apparently, is kept closed even during the day. The traveller, as he waits, can only see, close to the wall and rising boldly up above it, the Sultan's massive palace which now serves as barracks for soldiers.

We were obliged to wait at a respectful distance from the 361
menacing, fortified gateway until our letter of introduction 249
had been taken to the palace, read and deemed satisfactory enough to admit us into the tobacco town. Ghēl Bā Wazīr, as a city, has not many beauties except for the large and ancient palace and a few mosques, and we were glad to accept the invitation of one of the authorities of the place to proceed at once to the gardens and to the Sultan's country-house in the cultivated district behind the town. We, therefore, drove without pausing through the place, which reeked of tobacco. The 361
valley side of the town, that is the north side, has less defences 249
than the south, whence start the great thoroughfares to 487
Makalla and esh-Shiḥr. Nowadays motor lorries convey the bales of tobacco, which are two yards long, from el-Ghēl to Makalla. Manure for the tobacco fields is brought from the coast on camels.

A richly cultivated area begins immediately behind the town. 249
The Sultan owns much tobacco-growing land, which is said 361
to be a great source of income to him. Close behind the town 342
are two gardens, in each of which is a newly-built summer 471
residence. We enter the first garden with the smaller house which is set aside for the use of the male members of the household. In the other garden is a much larger building for the wives and their female attendants.

The gate is immediately shut behind us, our following of 351
inquisitive youths remains outside, and we stand in the silence of the luxuriant garden, trying to accustom our eyes to the deep shade under the blossoming fruit-trees. It looks just as

The visit to Sayyid Abū Bakr was quite official in character; 647
there are still risks ahead, we do not yet know each other and,
on either side, are cautious. The other government officials
whom we visited appeared to be men, not of the country itself,
but of India or Aden. Trade and banking have been mono- [463]
polised by the Indians, but latterly the Ḥaḍramīs have been
endeavouring to oust them.

As many Ḥaḍramīs are Dutch subjects and as I was con- 648
sidered to be their partisan, an impression which had been 641
still further strengthened by our intercourse with Sayyid ᶜAluwī
el-ᶜAṭṭās, we did not succeed in extracting much information
from these Indian officials.

Makalla has about 12000 inhabitants. The passport officer 162
told us that about 1000 Ḥaḍramīs come from Java every year 167
and as many return there; 400 to 500 pass through esh-Shiḥr. 272
Half of them take passage on through boats, while the other
half travel via Aden and Singapore. We also heard from him
that the old Arab custom of coffee drinking was being superseded here, but still more so in Ḥaḍramaut Proper by the tea-drinking habit, brought over from India and the Dutch East Indies. When we paid visits, tea was offered us more often than coffee. The weak brew stands ready prepared, with much milk and sugar, in a large enamelled kettle.

The chief Customs House officer kept the import and export 439
figures secret, pretending that the money value of the imports
was only of interest to himself and that he had never formed a clear idea of the total amount of the imported goods. The chief article imported is rice, from Bengal. The 40.000 or so cases of kerosene and gasoline, which are now a yearly necessity, will rapidly increase in the future.

8. A CLIMB ON THE MOUNTAIN RIDGE BEHIND MAKALLA.

One afternoon, surrounded by a crowd of youngsters, we 135
clambered up the steep, reddish wall of rock behind the town.
The view over city and sea from the edge of the plateau, 600 ft. high, is unique. There are four white towers for defence

133 standing in line close to the edge. The plateau is a few hundred feet wide, and the rock mounts again steeply till one reaches the flat top. The youngsters helped enthusiastically with collecting plants and catching insects. On the top we had a magnificent panorama landwards. There was just time enough to make a few outline sketches and to take bearings of the many mountain tops before the sun went down and it became cold. The guide said he would show us another and much easier way down, but it turned out to be otherwise, for he lost the way entirely; the boys left us in the lurch to find a good way home for themselves, and we could only progress slowly, in the increasing darkness, down the fairly steep rock-wall. Being an inexperienced climber I finally dared not, nor in fact was able, to proceed any further; with difficulty I reached a spot under an overhanging rock where, exhausted and with garments torn, I sank down. In the town below, however, they had been thinking of us, and after fully an hour we saw lights approaching from two different directions; they were soldiers sent out by the Vizier to bring us in. With much difficulty they reached the spot where we were held up. They had also thought of what one needs above all else on expeditions in this land — water. When I refused to risk the descent in the darkness and suggested waiting until dawn, the commandant of the patrol answered that he must bring us down that same evening. These experienced hill-men climb so well on their bare feet that I soon came to trust their directions, and we reached Makalla that evening without great difficulty. The leader passed with us in triumph through the crowd, which had been following our descent by the lights of our lanterns and had run out to watch our arrival. Our guide came to meet us coatless and without head-covering, as he had lost these garments during the descent in search of help. His answer to the reproach made to him from all sides was: "All comes from Allah. Allah let me lose the way, but brought you, nevertheless, safely down. Allah be praised!"

Ḥarshīyât we are put down by the road-side and, lying down 000
beside our baggage, wait there for some hours till the donkeys come. Then, in pitch darkness, we go forward at a steady pace, preceded by a Bedouin carrying a lantern. By the village of Tilāʿ es-Suflā we are to camp for the night in the dry *sēl*[1]-bed of the wādī. Luckily it is not long before the camels arrive. We set up our camp-beds amongst the boulders; under the mosquito-nets we are safe from the gnats that swarm here near the irrigated groves of date-palms and *dhura* fields. It is warm and very damp. Men and beasts lie close together. We are not yet accustomed to the sounds and odours of such a bivouac and get but little sleep. /

2. ON TREK TO WĀDĪ ḤIMEM.

An hour before sunrise everything is again in motion, but we cannot leave until the measurements are finished. The sun rises shortly after our departure. We are all thankful to say good-bye to this damp, hot mosquito camp, but fortunately each day brings us nearer to the dryness and coolness of the
Ḥaḍramaut mountain-plateau. The terraces at Tilāʿ consist 133
chiefly of conglomerations of round stones, and the vege- 137
tation is scanty but varied. Many acacias grow in the wādīs, here called *smur* (*acacia etbaïca*)[2], also aerva. Wādī el-Laṣb, through which we march, becomes broad and sandy, and the atmosphere becomes very warm.

A great disappointment, indeed annoyance, is to find that 484x
our advance party has already encamped at eight o'clock by a well at the edge of the wādī, where the burning heat of the sun is only tempered by some acacia trees. The baggage has been unloaded, and the Bedouins will not move for either love or money; they will first eat and then rest from the fatigues of the departure. It is so appallingly hot that we are in fear

---

[1] *Sēl* (سيل) is a torrent flowing after the rare rain- and thunder-storms and which usually remains only a short time. 104

[2] Cf. L. Hirsch, *op. cit.*, p. 300; Landberg, *Etudes sur les dialectes de l'Arabie Méridionale*, i., Leide, 1901, p. 349.

Tilā es-Suflā. In the foreground the dry *sēl*-bed, where we camped the first night.

Wādī el-Laṣb.

[facing p. 40]

133
137

Where Wādī el-Laṣb narrows there is a small brook and some vegetation.

/133

Wādī Ḥimem.

[facing p. 41]

system of drinking- and at the same time cooling-bowls, 271
among poor and rich alike.

Our host spoke with longing of beautiful, rich Java and of 167
the good years that he had passed there, and it was obvious that he would have liked to return there but for leaving his family behind, for the Ḥaḍramī woman does not leave her country with her husband. It was clear, from the friendly farewell, that I had not been wrong in thinking that my years passed as a civil servant in Netherlands India would facilitate my travels in Ḥaḍramaut.

They all went a little way with us to see us off and were 138 ●
photographed at their own request. We followed the broad 312
sēl-bed [1] crossing the plateau surrounded by terraces of about 300 feet high. There, where the plateau ends, lies, at a height of 50 feet the village of Ḥimem on a hill at the edge of the wādī to which it gives its name. At the foot of the hill, there are very tall coco-nut trees, the last that we shall see for the time being, for the altitude is already 3000 feet. A conduit full of water, fed by little springs at the edge of the wādī, irrigates fields of *dhura* and of neatly-planted and well-cultivated tobacco. It is true that it is not first-class Ḥumūmī tobacco that is raised here, but even so it commands a good market price.

The evening falls and we are obliged to camp soon after 133
leaving Ḥimem. The valley has here penetrated into the sand- 271
stone and the conglomerates under the eocene limestone. Here at a height of 3000 feet the nights are already cold. According to our Bedouins, who are good water-tasters, the water also improves in proportion as one gets further away from the coast; all salt and bitterness gradually disappears from it.

In our bivouac at Ḥimem we had to put away again a great 136
harvest of plants and insects; the swallow-tail butterfly was also found here.

The mayor of Ḥimem came to visit us in our camp. He told 249
us that his village of 200 to 300 inhabitants grows tobacco,

---

[1] The bed through which the water flows for a short time after rain.

249 which is its chief source of livelihood. Only three of his men have emigrated to Java, but he has heard so much good of that land of promise that he wishes to go there himself, though it would mean leaving a family of six children behind. To my question as to whether he had performed the *ḥadjdj*[1] his answer was in the negative.

000 We have met very few travellers on the way from Makalla to Ḥimem — only a few camels and donkeys laden with bananas and other fruits for the Makalla market.

On the 11th of May, directly after breaking camp in the morning, we began by ascending a long *ʿaqaba*[2] and it was two hours before we reached the top. A little farther on we passed a place called Kubr, which our Bedouins pretended was the last spot for hours ahead, where we should find water, and they urged us strongly to take the afternoon's rest here. Immediately after I had agreed to this, it dawned upon me that the story about the water had only been invented in order to call a halt. The spot was very unfavourable, for water had to be fetched from some distance away out of the 20 feet deep bed of the wādī, where there was a well. We were obliged to seek shelter from the sun, in a fissure of the rocks which hardly gave room enough.

133 Von Wissmann used the opportunity to climb the steep precipice leading up to the plateau, in company with one of the slave soldiers. The eocene limestone, of which the 60 feet thick upper stratum is formed, falls away everywhere in a perpendicular drop, so that it is difficult to find a scaleable spot in it. Our Bedouins did not believe that the *Efrendjī* 000 could get up it in his shoes, and his attempts were watched with curiosity from our bivouac. When Von Wissmann, born and bred among the rock-mountains of Styria, conquered a very hazardous bit of wall and his soldier could only follow

---

104 [1] The *ḥadjdj* is the pilgrimage to Mecca, one of the five pillars of the religion of Islam.

[2] *ʿAqaba* (عقبة) is a road over or up, or down, or over some part of, a mountain; cf. Lane, *Arabic-English Lexicon*.

with difficulty, his popularity with our Sēbāni people was es- 000
tablished for good. From thenceforth he was named *Ḥarmal*, a name of good companionship, which stuck to him as long as he was in Ḥaḍramaut. Ḥarmal is a corruption of Hermann; it is at the same time the name of one of the most common plants in Ḥaḍramaut, a plant inedible for cattle and, consequently, worthless.

My name they could not keep in their memories, so from this time on I was called Konsul. Bedouins are a very democratic folk: whenever they had anything to ask or to say they did not lie in wait for a favourable opportunity, but would shout out from the rear of the caravan: "Yā Ḥarmal!" or "Yā Konsul!" I would then immediately reply in an equally loud "Yā ḥādjdj!" or "Yā Sēbāni!" Then came the question, to which, whenever possible, I gave a jocular reply. They enjoyed laughing, and if one could manage to maintain one's hold on them by keeping them in good humour, it was possible to crack many a hard nut. It seemed to me very necessary to be good friends with one's Bedouins, but at the same time to keep them at a distance and to make one's authority felt.

Up above on the edge of the plateau[1] Von Wissmann had 133
a fine, distant view. To the south were esh-Shiḥr and the sea, to the north the highest mountain of Ḥaḍramaut, Kōr Sēbān, a great massif of eocene limestone. On the east and west were the endless plain and, still visible close by, the deep-cut wādīs, and higher up the long horizontal line of the table-mountains.
Several kinds of acanthus were growing close to the rock-wall 137
and crossander, with blue-green leaves. *Cadia varia* appeared here for the first time, but later on was often to be seen in the wādīs.

When the sun began to penetrate into our rocky cleft and 000
the temperature rose to 33° C., we were forced to break camp, although our Bedouins were not yet inclined to do so. It took a great effort to wake them up, and, while they were trying to find their camels, which had wandered off in search of food, we sauntered on ahead. At first the way wound along

[1] [See preceding page -- Analyst]

000 the fairly steep slope of Wādī Ḥimem, high above the *sēl*-bed. We looked down on the fresh green of small trees and shrubs; a shepherdess with her flock of goats was occasionally to be seen amongst them. The path then dropped down towards the wādī; walking over the grey-white boulders and under small acacias with scanty foliage, we made our weary way to the end of Wādī Ḥimem, in and beside which we had been journeying for days past.

4. THROUGH WĀDĪ LUṢŪB TO THE GREAT ROCK PLATEAU. THE CAMP AT EL-ḤISĪ.

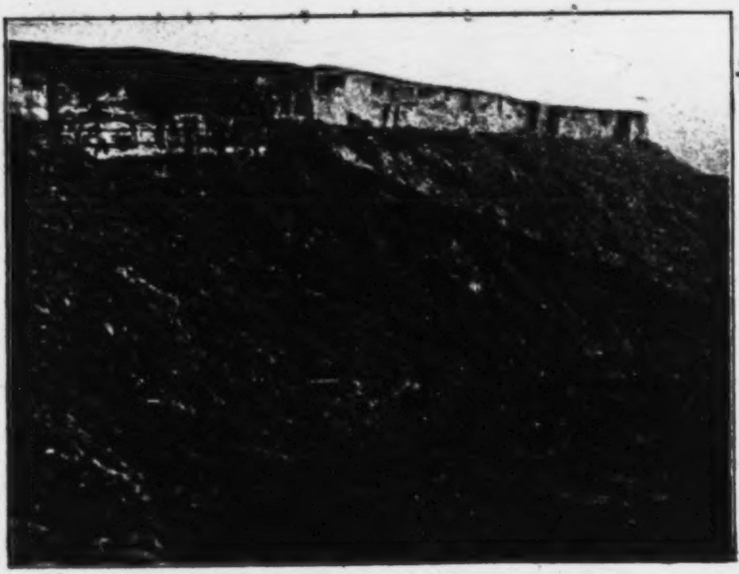
133 We came out onto a high plateau, but soon entered the wide,
361 shallow bed of Wādī Luṣūb, which was fairly well covered
312 with vegetation. Small, poor houses lie scattered here, like cubes of stone, with very primitive little gardens. The people live principally by breeding sheep and goats. We made our quarters for the night just beyond the houses, forming the hamlet of el-Ḥisī, beside a large well of masonry within which one descends by stone steps to the surface of the water. The well had been dug in the *sēl*-bed and was therefore protected by a thick wall, as high as a man, against the water floods which appear after rain. In el-Ḥisī lived the family of Mautor, the leader of our caravan, and hence the dawdling which characterised this day; on no account were they prepared to go beyond el-Ḥisī.

245 All bickering was forgotten now and our Bedouins radiated
262 contentment and willingness. The people of el-Ḥisī set to work cutting up food for our animals, all the inhabitants came to have a look at our camp, and, afterwards, Mautor took all his comrades with him to feast in his village. He brought us, beforehand, a cloth full of *nibq* fruit. The *nibq* tree, also called *sidr* or *dōm*, is of intrinsic importance in those parts of Ḥaḍramaut where there is too little water for the cultivation of the date-palm. There, wherever one is dependent on the *sēl*, the water which only comes after rain, and where the subsoil

137

Acacia trees, further inland in Wādī Ḥimem.

133 [1]



The slope of the Kōr Sēbān.

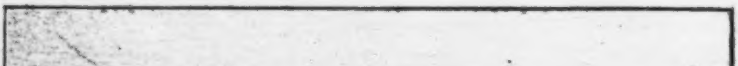
[1] [See pages 46 and 47 and pages 50-51 --Analyst]

p.48(A)

See pages 48 and 51

137

The border of the *djōl*, with some vegetation (euphorbias and acacias).

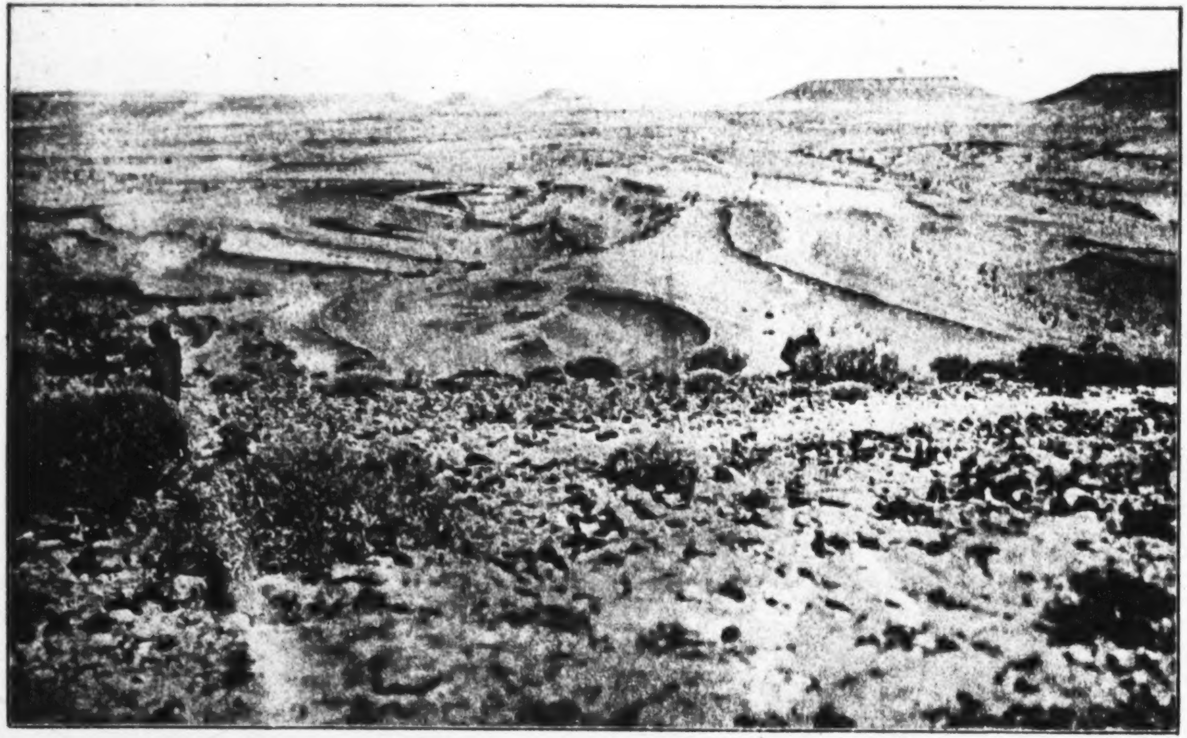


138

A view over the *djōl*.

p. 48 (C)

p.48(D)



The *djōl* with the long horizontal lines of the table-mountains in the distance.

water is too far below the surface to serve for the regular 245
irrigation of a plantation, the *nibq* can still live quite well, 262
and even if there is no rain for some years it does not die. The
fruit of the *nibq* is as large as a marble and has a stone of the
size of a pea. The taste is sour-sweet and refreshing. The fruit
can be dried and kept for a long time: it is then crushed fine,
stone and all, and with the meal bread is baked or a sort of
porridge made. This small fruit is the chief food supply of
many in times of drought, and in times of scarcity many
Bedouins live on *nibq* and milk and do not look ill on the
diet. The shepherdesses carry the *nibqs* with them in small
oval, prettily woven baskets.

The wood of the *nibq* tree is reddish-brown and hard, and [313]
is used for beams and supporting pillars in the big, many- 314
storied, mud houses of the rich. The branches, thick with 262
thorns, are used in the date plantations when the bunches of 231
dates approach ripeness. They are bound in a wreath round
the trunk just below the clusters of fruit, to prevent the dates
from being stolen. Finally the green leaves of the *nibq* are also
useful: when, during a long drought, there is hardly any more
food to be found for the sheep and goats one sees the agile
shepherdesses, in spite of their flowing, black garments, clambering
up to the top of the *nibq* tree and knocking off the
leaves from the branches with long, thin sticks. The flock
stands below the tree in expectation of the godsend of food to
come. We have only a mild admiration for the *nibq* fruit: one
must do much chewing for little nourishment and for little
taste.

They also brought us from el-Ḥisī a few handfuls of the 262
roasted larvae of white ants. The taste was not bad; Von
Wissmann ate up a whole helping with the result that, shortly
afterwards, he had a pain in his throat and could not utter
a sound, a condition that lasted for about two hours.

El-Ḥisī lies about 4500 feet above sea-level, and the 133
evenings are quite cold. While there, we examined the bundles 600
of plants which we had already collected and pressed. Great

010 was our disappointment on finding that many of them were mildewy. It was a long and very disheartening work to remove the damaged plants and to replace the damp paper with new. We were now in high-lying dry country and from henceforth might expect to have no further difficulty with the already decreasing quantity of plants collected. After this, we always opened the presses during the afternoon rest and laid stacks of the papers which contained the plants, held down by stones, to dry in the fierce sun and hot wind. Thus the collection of plants was safeguarded against decay.

5. KŌR SĒBĀN, THE HIGHEST TOP OF ḤAḌRAMAUT.

The camp at el-Ḥisī lay at the foot of Kōr Sēbān, which of course Von Wissmann wanted to climb. We arranged that he should start early on the following morning with one of the soldiers and a Bedouin guide, whilst I, with the other soldier, should attend to the timely breaking up of camp and the speedy advance of our caravan. We were to meet again at the afternoon halting place.

The night in el-Ḥisī was so cold that, towards morning, sleep became impossible, so that early rising was quite easy. On this morning of May 12th we marched from half past six until eleven o'clock. Our way lay smoothly over high-lying level ground, remarkably flat limestone plateaus, into which the wādīs cut vertically and where the lateral wādīs begin.

133 So little rain falls here that the origin of these steep-banked wādīs, already cut so deep from the beginning, cannot be sufficiently accounted for by the erosive action of rain-water only. The Bents have assumed that these wādīs were formed by the sea and that this is the explanation of the likeness, everywhere to be found, in the outline of the walls on each side of the wādīs.[1] This supposition does not appear acceptable. It seems to us that Caetani's theory of the drying-up of Arabia and possibly of the whole world might offer a plausible

---

[1] Bent, *op. cit.*, p. 90.

explanation of the facts. More rainfall on this bare table-land, 133 where all water immediately streams away, must have caused mighty floods streaming with elementary force through the wādīs to the sea. In this way wide, deep ravines in the plateau can have come into existence. The monotonous likeness in their outlines is to be ascribed to the fact that the ground, in which the erosion takes place, always shows the same composition and that the climatic conditions of the interior are invariable. A horizontal stratum of limestone, 50—100 yards thick, lies on a similar horizontal sandstone stratum. The limestone layer has, at the edge of the wādī, an almost perpendicular incline as has the sandstone layer also at first, but it then merges into the slopes of rock débris, which reach quite high up the walls of the wādī. The little towns and villages lie, in the [361] narrow wādīs, on these slopes of débris, while in the broad wādīs, as also in Ḥaḍramaut Proper, the towns and villages are built in front of the débris.

Kōr Sēbān is the highest mountain of Ḥaḍramaut though its altitude is not more than 7088 feet. The summit is a gradual elevation, rising out of the high-lying plateau surrounding it. The eocene limestone strata are 1200 feet higher than the plateau, yet fairly horizontal, as is the case with Djebel Ghurēba, visible in the distance. Violent tectonic disturbances must have taken place here. A camel path leads upwards to the flat top of Kōr Sēbān, from where one has a fine view over the Wādī Ḥuwēre, which makes a deep cutting on the further side of Kōr Sēbān and lies quite 3000 feet lower than Wādī Ḥimem. Djebel Ghurēba, which is certainly not much lower than Kōr Sēbān, also appears to be separated from the latter range by a deep valley on its southern side. Djebel Baraka, two days' march distant, must be about the same height.

On one of the highest points of Kōr Sēbān there was 137 growing an *arab*, apparently a *dracaena*, with large clusters of reddish blossoms. The trunk had been mutilated by the removal of pieces of bark, and living boughs had also been hacked off. On the summit plateau there was seen for the first time a semi-

formation. They belong to the plateau called *djōl* (جول), 312
lying between the mountainous coast region and the great 104
depressions of inner Ḥaḍramaut.

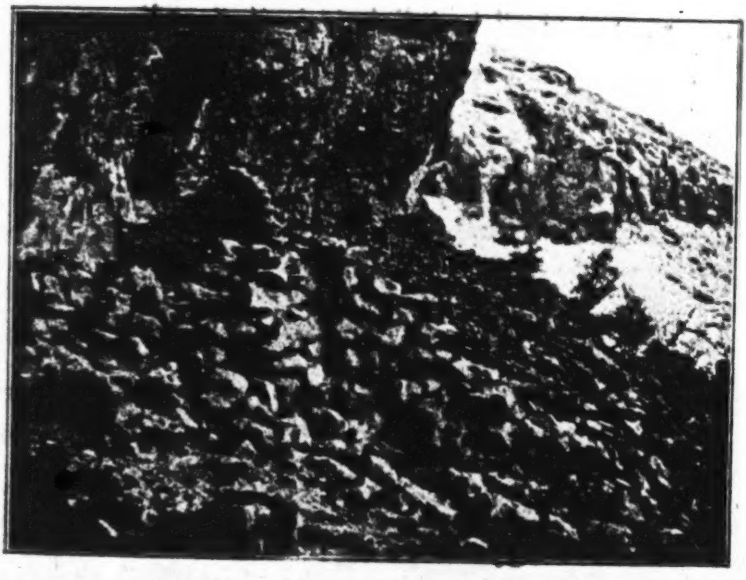
6. THE DJŌL.

Our way now led over the *djōl* as far as Wādī Dōʿan. The 133
djōl consists of vast table-lands of reddish-brown limestone,
where flat-topped, horizontal mountains, the remains of old,
still higher plateaus, stretch like long wings. The wādīs are cut
deep into them. We also often descend into flat, basin-shaped,
wide depressions, passing over the crumbling edges of the
plateaus, and afterwards have to climb laboriously up again,
towards the boulders at the edge of the opposite plateau,
quite half an hour away. Wherever one looks one sees the same
long, horizontal lines of the table-mountains, with everywhere
the forked, precipitous incisions made by the wādīs. The plain
is strewn with sharp fragments of limestone, dark-brown and
black in colour, which ring like metal whenever the passer-by
kicks pieces of them together with his foot. Vegetation is almost 136
absent. Towards the edges of the plateaus, against which 137
clouds sometimes seem to break, there are a few shrubs
of small, crooked, gnarled acacias. One finds no trace of animal
life except a few lizards and sometimes a solitary bird. It is
very warm on the *djōl* during the day, the sun scorches, and
the wind is hot and dry. During the night this same wind is
cold and penetrating, so that one wakes up and remains awake
longing for the warmth of the sun hours before it rises; then an
hour later it is torment again from the heat.

The endless monotony is the great enemy of the traveller 000
over the *djōl*. The light is fierce and is reflected a thousand
times in the metallic shining stones. The narrow camel path
winds like a smooth and shining ribbon through the unruffled
and almost unchanging expanse. The stones have been pushed
aside by the feet of the camels which, in the course of so many
years, have passed that way. The limestone of the plateau

133

Trekking over the *djōl.*



172

The Dār ʿĀd, ruins dating probably from Sabaean times.

[facing p 56]

● 133

Wādī Thiqbe, close to Dār ʿĀd.

[facing p. 57]

See page 57.

this, there were the remains of the houses which these people 172
had inhabited in the days of the preaching of Hūd, the prophet of Allah. It was arranged for the caravan to go ahead as usual and for us to rise early and set out on a rapid excursion to the ʿĀd remains, without losing a day of the time on our schedule.

The night in Bureyyira seemed very cold, yet in the morning 050
the temperature was only 18° C. The night-wind and the great contrast with the heat of the day make one feel the cold very much. We set out at 5 o'clock under the leadership of Aḥmad and the protection of the soldier ʿUbēd. We went first by the road on donkeys for some hours and then, leaving the animals with their attendants behind us, we struck into a side-path that led over massive rocks to the source of Wādī Ghār. The wādī is very soon deeply hollowed out and we climb with difficulty high up along its steep wall, but luckily that does not last long, and we approach the wādī-bed. Occasionally our way is blocked by great, greyish-white boulders. All sorts of interesting plants grow against the wall of rock as, for example, *anisotes*, which is also to be found at el-Ḥisī. We followed the bed of this narrow, deep wādī for a long time, and our eyes were refreshed by the colour of many an acacia. After stren- 1330
uous climbing we reached the broader Wādī Thiqbe, where 312
we had to circumvent immense blocks of rock. The *sēls* must have formed waterfalls here by which deep basins have been hollowed out of the rock, which in several places still held some water, though rather thick and brown. Now that the sun is so high that its rays reach the bed of the wādī, the temperature rises very quickly, and the prolonged and hard exertion makes us very thirsty. The water-supply that we brought with us is soon exhausted, but these basins of brown water arouse aversion. There is some shadow given by a number of trees, among which are some large *nibqs*, and that is the spot where we rest. Aḥmad really knows the way well. He brings us to a deep pool, hidden from sight by rocks, which has straight walls and is quite full of brown water. Though we dare not 825

CHAPTER IV.

WĀDĪ DŌᶜAN.

1. THE DESCENT.

The stupendous, precipitous depression of Wādī Dōᶜan can 133 only be seen when close at hand, for the high table-land continues unchanged on the further side. The walls have a sheer drop of more than 900 feet to where the bottom of the valley is pressed in between the slopes of débris, at the base of the rocks. We approach a little breach in the wall through which 000 it has been possible to make the camel path. Sayyid ᶜAluwī without pausing goes on ahead with the advance guard, longing as one does, after wearisome travel, to enter again the civilized life of a town.

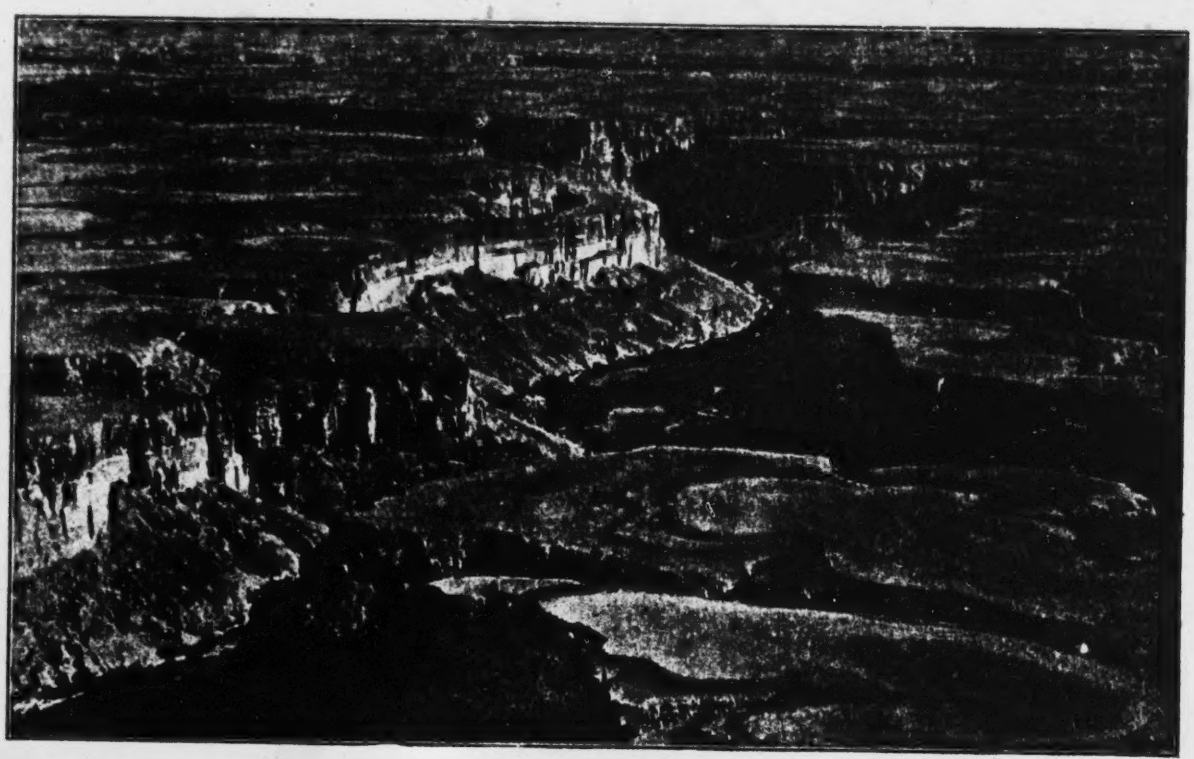
For the time being we remain up above to take bearings and photographs. Where the descent of the rock path begins there is a fortified tower of solid stone. [1] We see a similar one on the other side at the edge of the ravine. There are continuous military posts which watch over the safety of the rich wādī below. We cautiously approach the overhanging, crumbling edge and gaze down below, full of awe. We see around us endless, grey-brown fields of stone, plantless and odourless, opposite us exactly the same as far as the eye can reach, and immediately at our feet glittering, yellow walls of rock, and then, down below in the depth, a marvel of colour and charm. The sun shines right into the wādī, where no life or movement are to be seen. Between patches of gay yellowish-green, formed by the fields of *dhura,* maize and lucerne, lies unruffled the broad, shining, grey-green strip of date-groves. Through it there winds a snow-white ribbon, the sandy bed of the *sēl.*

---

[1] Here called *kūt* (كوت), plur. *akwāt*, a word of Persian origin. 104

p. 61

Photo Royal Air Force Official crown copyright reserved



The stupendous, perpendicular depression of Wādī Dōʿan.

See page 6

[facing p 60]

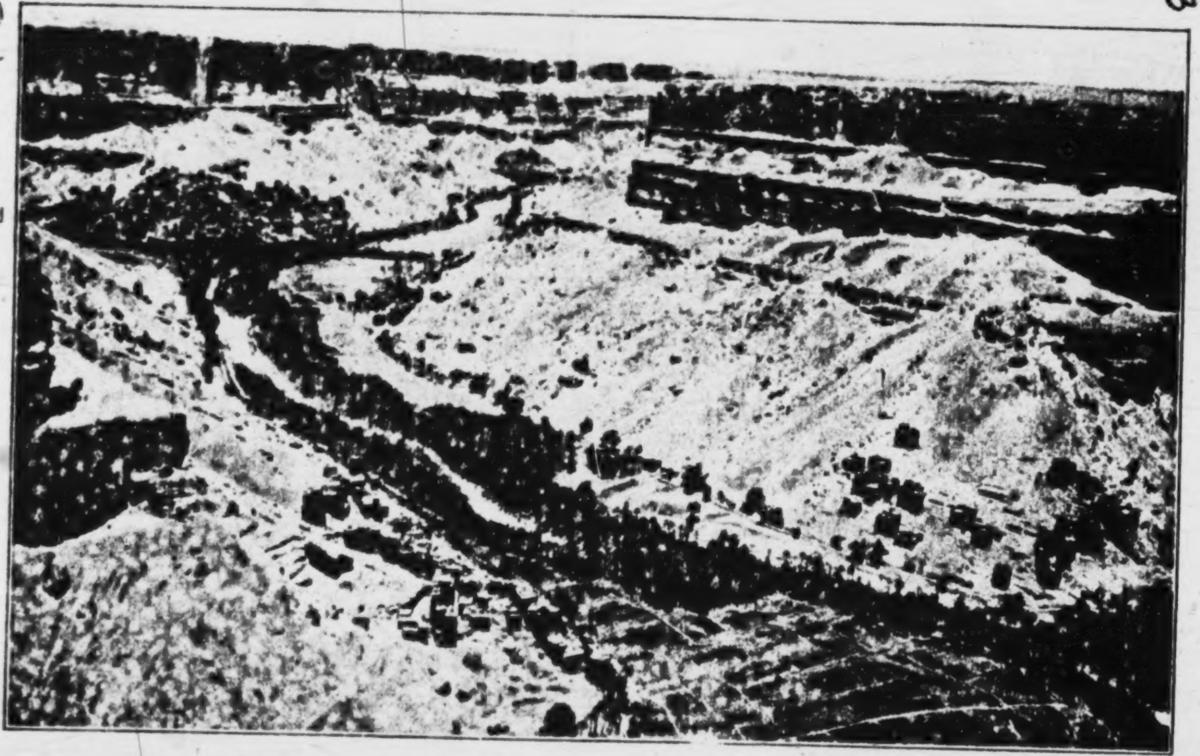
8. APPROACHING WĀDĪ DŌʿAN.

We notice that we are approaching the great *ʿaqaba* leading 484
to Wādī Dōʿan; some long caravans with rice from Makalla 133
pass us, and about twenty villagers on donkeys, bound for Makalla, come towards us. We start off again at half past three, crossing the dry, high table-land, with a distant horizon vanishing into a blue mist, against which are outlined the low, far-stretching mountain plateaus — an extraordinarily monotonous, colourless and formless landscape. The next day, when we descend into Wādī Dōʿan, we shall take leave of it for 000
a while. Thus it will be the last night of bivouac with our Sēbānī people.

At Ḥumḥār we camped behind the edge of a plateau, where there was some shelter from the wind. On the way, after some bargaining, our men have bought a sheep. The prospect of the feast reduces them to such confusion of mind that they unload the camels some distance from us. We notice this too late, but try to insist that they shall reload them; however, we have finally to content ourselves with the promise that they will carry to our camping place the pieces of luggage that we need. They let us wait: the sheep is killed and made ready and they all go out to collect the firewood and it almost seems as if they will take no further trouble about us. To avoid this, Ṣāliḥ and the soldiers carry all the Bedouins' food away to the spot where we have established ourselves. We wait in suspense to see what will happen! The Sēbānīs return from all directions, throw their wood in a great pile and light a fire, which is to heat the stones upon which the meat will shortly be roasted. Meanwhile, when they want to prepare the dough for the bread, they discover that all the food has disappeared. The merry excitement abruptly ceases, and, after a moment of amazement, indignation bursts forth in effervescence. Mautor approaches us with two companions to demand the return of their food supplies. They speak first with our soldiers and with Ṣāliḥ, who treat them to a torrent of reproaches, but

24:Meulen and Wismann T-3 (1931)1932 MM2 Hadhramaut MM2

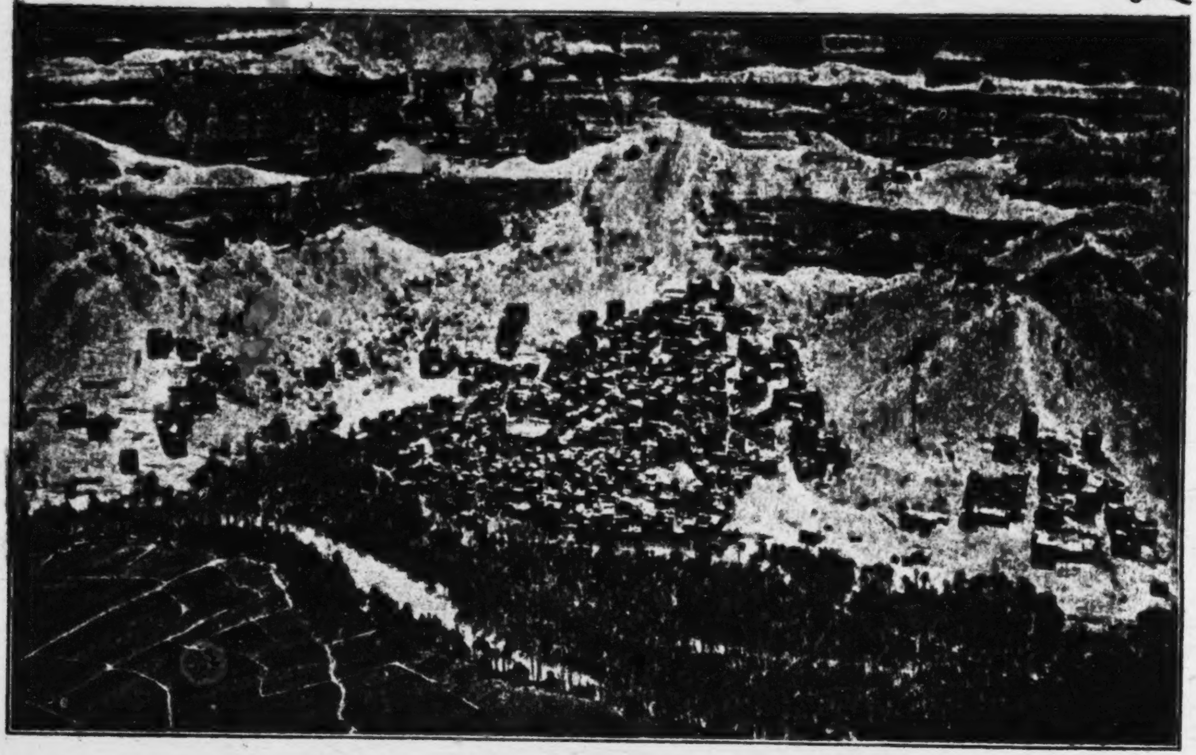
[facing p. 61]



Wādī Dōʿan. A green river of date-palms and the snow-white ribbon of the *sēl*-bed.

361
133

p64 (B)



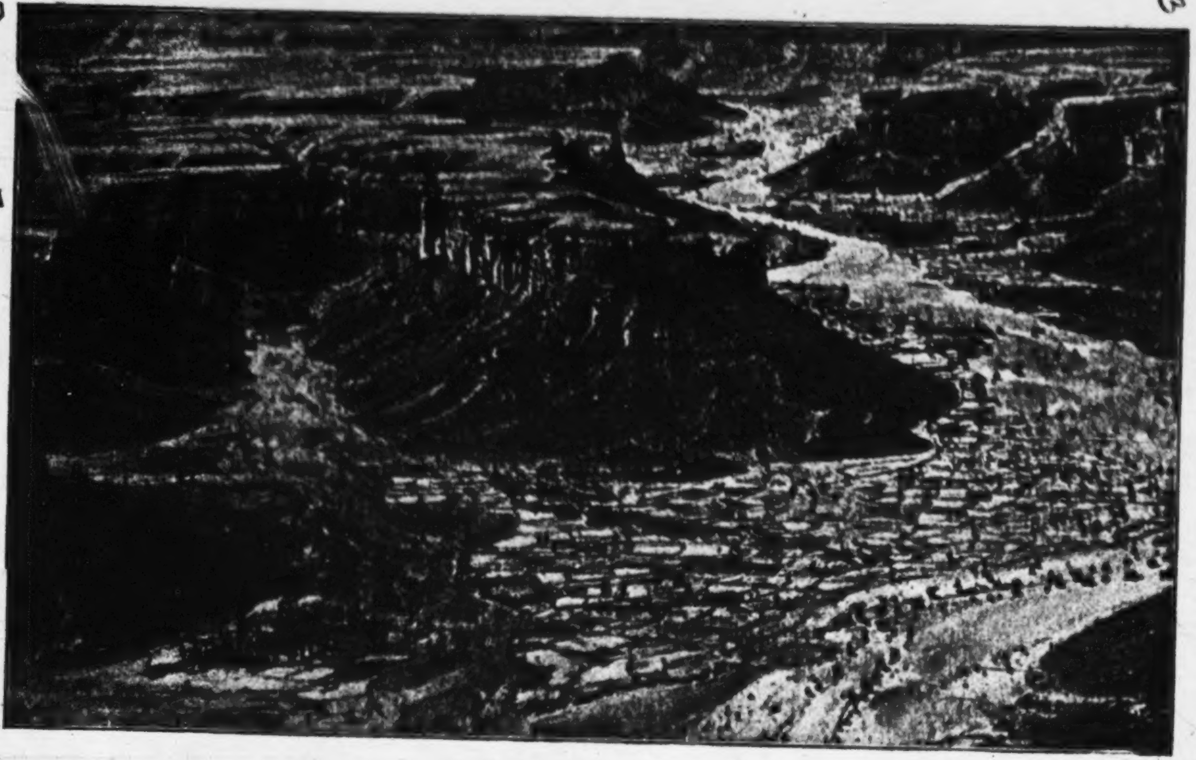
Khurēba, the principal town of Wādī Dō'an.

[facing p 73]

133

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

Photo Royal Air Force Official crown copyright reserved.



Wādī el-ʿĒsar debouching into Wādī Dōʿan near Ṣīf.

See page 77

CHAPTER VI.

ḤURĒḌA, THE CENTRE OF THE EL-ʿAṬṬĀS CLAN.

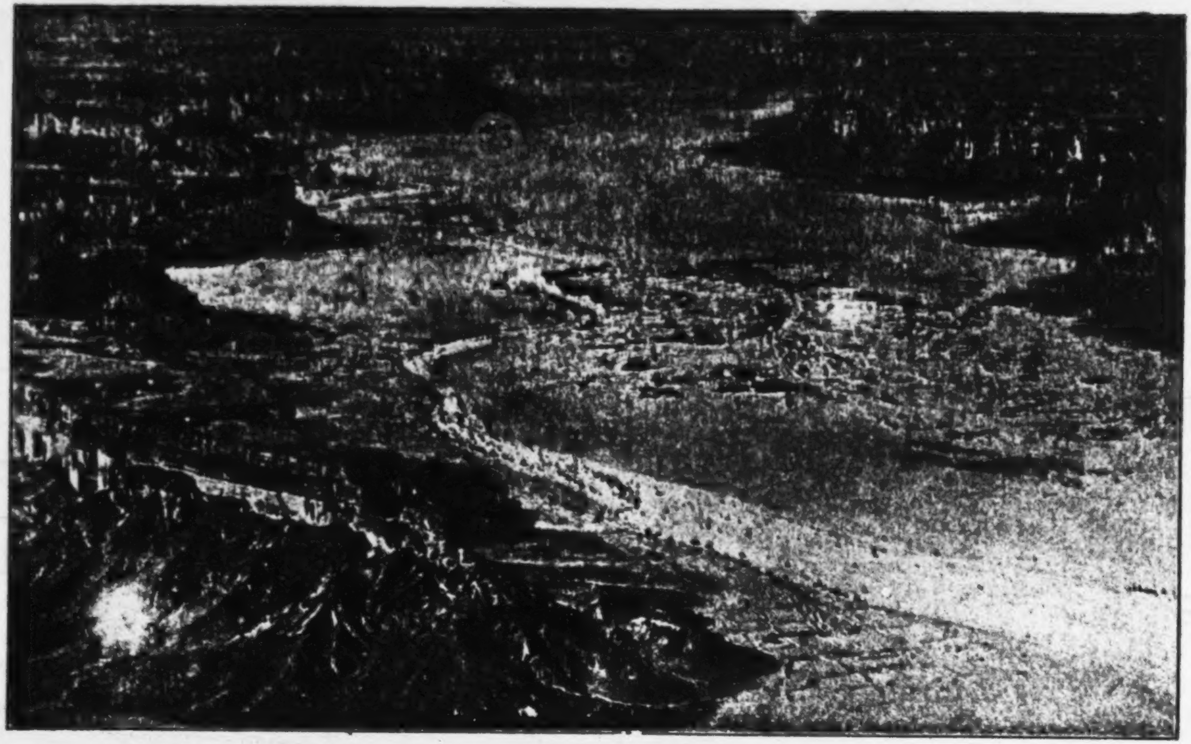
1. FROM EL-MESHHED TO ḤURĒḌA.

133 361 In the afternoon we leave el-Meshhed under the guidance of Sayyid Ḥasan, and travel through the great, wide, plantless wādī to the mouth of Wādī ʿAmd. The bed of the wādī is here called Baḥrān, "the two streams", as the *sēl*-beds of Wādī Dōʿan and of Wādī el-ʿĒn, to the left and the right respectively, separated from each other by a plateau of sand and loam, meet at this point. The villages of Sidbe, which lie like tall castles at the foot of the mountain, get the water for their palm-groves from Wādī el-ʿĒn. To the right in the far distance there lies the village of Ḥōra with a great castle and a watch-tower on a hill. It is a small Qeʿēṭī island in the midst of an Āl Kathīr sea.

When we reach the mouth of Wādī ʿAmd and there take an inward bend in a south-westerly direction, the sun is setting in a magnificent glow of light. We feel diminutively small in the broad river-beds of sand with their far-away high banks. We have passed from one *siqāya* to another. We enter Wādī ʿAmd, following closely the rock-wall on its south-western side. High up against that wall, which is in a somewhat crumbling condition here, we see a few fortifications and towers. In the wādī there are some tilled, but still bare, fields in the midst of the sand; *nibq* trees and bushes grow [609] scattered here and there. Sometimes also we pass a few date-palms and little settlements, the inhabitants of which call out to us in suspicion as we go by. As soon as they hear that *sāda* (*i. e.* sayyids) of the el-ʿAṭṭās family are with our party, the words of salutation ring out *"Yā ḥayya!"*, an abbreviation for "May Allah give you life!"

r 88

Photo Royal Air Force. Official crown copyright reserved



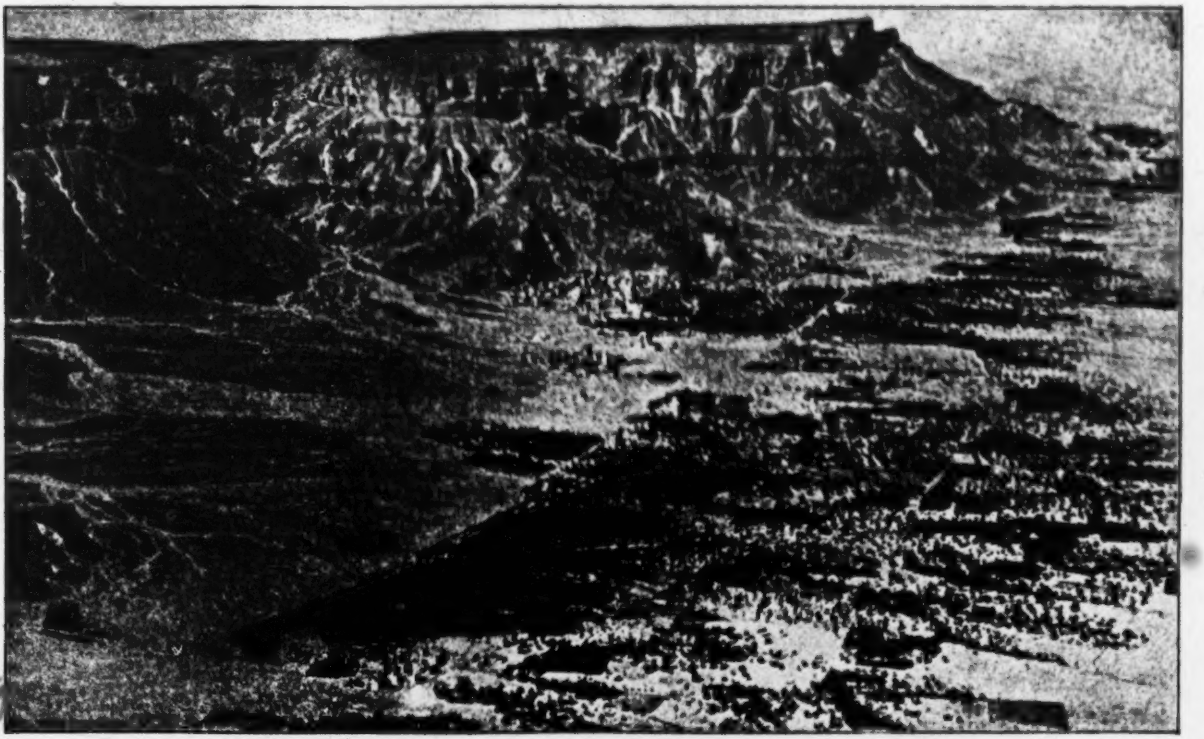
Wādī ʿAmd, at its juncture with Wādī 'l-Kasr, looking eastward.

p88(A)

133

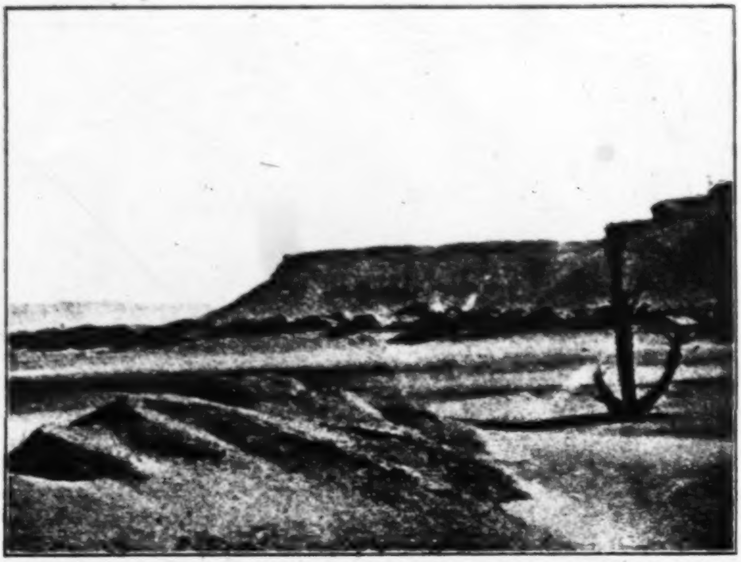
See pa

Photo Royal Air Force. Official crown copyright reserved.



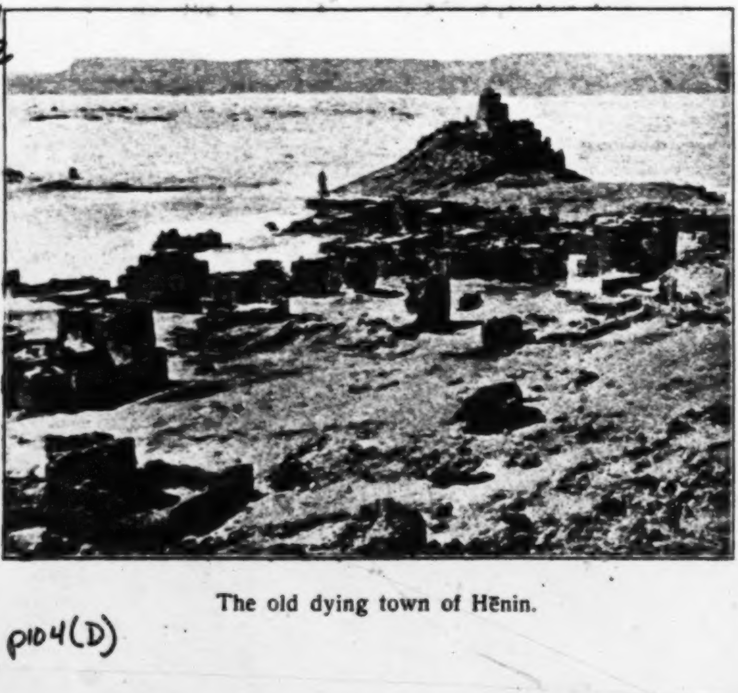
The el-Qaṭn district, with Ḥōṭat el-Qaṭn in the centre, at the foot of the rock-wall.

133



Hillocks of loam and sand near Diyār Al Buqrī.

361
342



The old dying town of Hēnin.

p104(D)

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

CHAPTER VIII.

ENTERING OUR "LAND OF PROMISE".

1. EL-QAṬN AND SHIBĀM.

On May 23rd our host would not allow us to depart until 000 we had partaken of the first of the two daily meals with him. There is no apparent objection to this, as Bin Marta^c will take us himself in his car to el-Qaṭn. The heat and the sandstorm are very unpleasant. It is now the time when the dates ripen. The heavy, bright-yellow or deep-red bunches of fruit, sometimes as many as ten on one tree, need those hot winds to bring them to ripeness. Travelling in the sandy plain is not only unpleasant at this time, but it is also difficult to keep in the right direction. It is true, Bin Marta^c will look after that, but Von Wissmann has great difficulty in making a drawing of our route, surveying the mountain-wall, which is just visible from time to time, and sketching in the villages.

After Hēnin we enter a real desert of sand. The soil is 133 loess, but a thick layer of sand has drifted over it in the lower-lying places. A few bushes of *rāk*[1] grow here and there on the loam-hills. The wādī is seven miles wide here, the villages on the other side of it disappear in the sand-storm. We shape our direction towards the S. W. wall of the wādī, to the spot where Wādī Menwab debouches into it. Soon after the rocks come in sight we also see the tops of the date-palms shining through the leaden-coloured curtain of dust.

Furṭ[2] el-Qaṭn, the beginning of the inhabited, cultivated 361

---

[1] Classical *arāk* (أراك), *salvadora persica* Garcin, cf. Landberg 137 *Arabica*, N^o. v. (Leiden, 1898), p. 39 *sq.*; L. Hirsch, *op. cit.*, p. 191, 211, 306.

[2] A *furṭ* (فرط) is a prominent top at the border of a mountain 104 range.

p 107

We notice, when passing through the lower floors of the palace, that a school is carried on there, in which some hundred and fifty boys receive elementary secular and religious instruction. The silent, but friendly representative of the Sultan shows us out as far as our car and allows us to photograph him with his own surroundings in front of the house. 872

3. THROUGH A SAND-STORM TO "THE TOWN" OF ḤAḌRAMAUT.

We now drive through the cultivated tract of land to its 000
sandy, outer margin. The sand-storm meanwhile has increased in violence and Bin Martaᶜ loses the way from time to time so that we make but slow progress towards Shibām. It is fortunate that we had clear weather in which to see this part of our route on the return journey and so were able to fill in the necessary details in describing it. Not far from Ḥōṭat el-Qaṭn the fertile strip of land becomes very narrow and later on quite vanishes. The villages look then like small green islands in the otherwise bare land at the foot of the mountain. Our way goes through sand-hills grown over with a kind of reed.

Not far from Shibām we pass through the fields of *dhura* and small palm-groves belonging to the villages of el-Hēme and Āl Shēkh ᶜAlī.

At this point the cultivated ground reaches the bank of the 133●
deep *sēl*-bed. During the rains the *sēl* here threatened to degenerate from a blessing into a danger: rushing torrents of water forced their way through to the valuable palm plantations of Shibām and washed bare the roots of the trees. A cemented stone dam with sluices has been made in the *sēl*-bed to keep down the rush of water; it is quite half a mile long. Earlier dams have been destroyed, over and over again, by the *sēl*; this one has been made at great expense, and it seems to be capable of holding up and conducting the water.

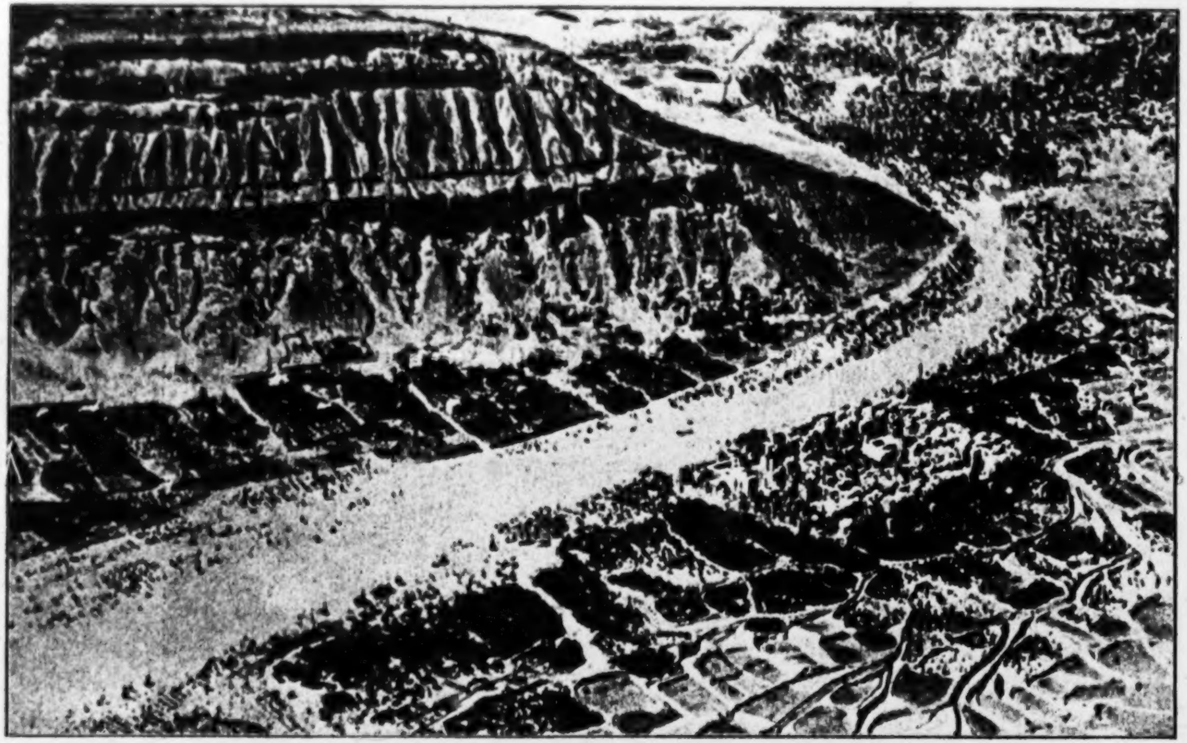
The last part of the way to Shibām goes again over a plain, 137
bare of vegetation, where the hot sand-storm has full play. On 361

133 the right are fields and some groves of date-palms which seem
361 to be dependent on rain, hiding themselves behind the wide
curtain of dust. Suddenly we see before us something that
resembles *fata morgana*: a square, grey mass rises high
up above the desert, and its upper side looks as if it were
361 covered with snow. There lies Shibām, the New York of Ḥaḍramaut, one of her three great cities and the centre of her commerce for centuries past. It was probably an important town even in pre-Islamic times.[1] High walls protect the palm plantations against the drifting sand; they are therefore invisible and the marvel of the great city looming up out of the desert breaks forcibly upon the stranger as he approaches Shibām from the direction of el-Qaṭn for the first time. No town of Ḥaḍramaut is built so compactly and of such high houses as Shibām. Nearly all the houses have a whitewashed roof-storey, which gives that wonderful effect of a brown cake powdered with sugar. The city is straitly enclosed by a high, strong wall which, to a great extent, is incorporated into the back of the houses. Just at a short distance from the wall the road passes over a bridge made of the trunks of palm-trees, which spans a waterless irrigation canal, and enters the date plantation. Everything is covered with a layer of dust. The drought has been so great this year that these palms, which are dependent on the *sēl*, have been unable to produce fruit. The road follows the wall round the city, then descends to the broad, level sandy bed of the *sēl*, in the middle of which is a series of wells from which the people of the town draw water. From here a wide slope leads to the high, double gate of the town. The car gets up the bumpily paved ascent with difficulty, and we pass through the first gate to another one, 90 feet further on. We are then in a square where camels are resting, which, terrified by our car, rear on their hind legs and try to run away, in spite of their being hobbled and their heavy loads. The square is shut in on the right side by the

[1] Cf. el-Hamdānī, *op. cit.*, p. 86, l. 24, 25; 87, l. 3, 25; *Encyclopaedia of Islām*, Art. *Shibām*, 4.

Photo Royal Air Force Official crown copyright reserved.

p112 (13).



Shibām, beside the broad sand-river.

See page 112.

133

CHAPTER IX.

SĒWŪN, THE HEART OF ḤAḌRAMAUT PROPER.

1. PENETRATING INTO THE ĀL KATHĪR TERRITORY.

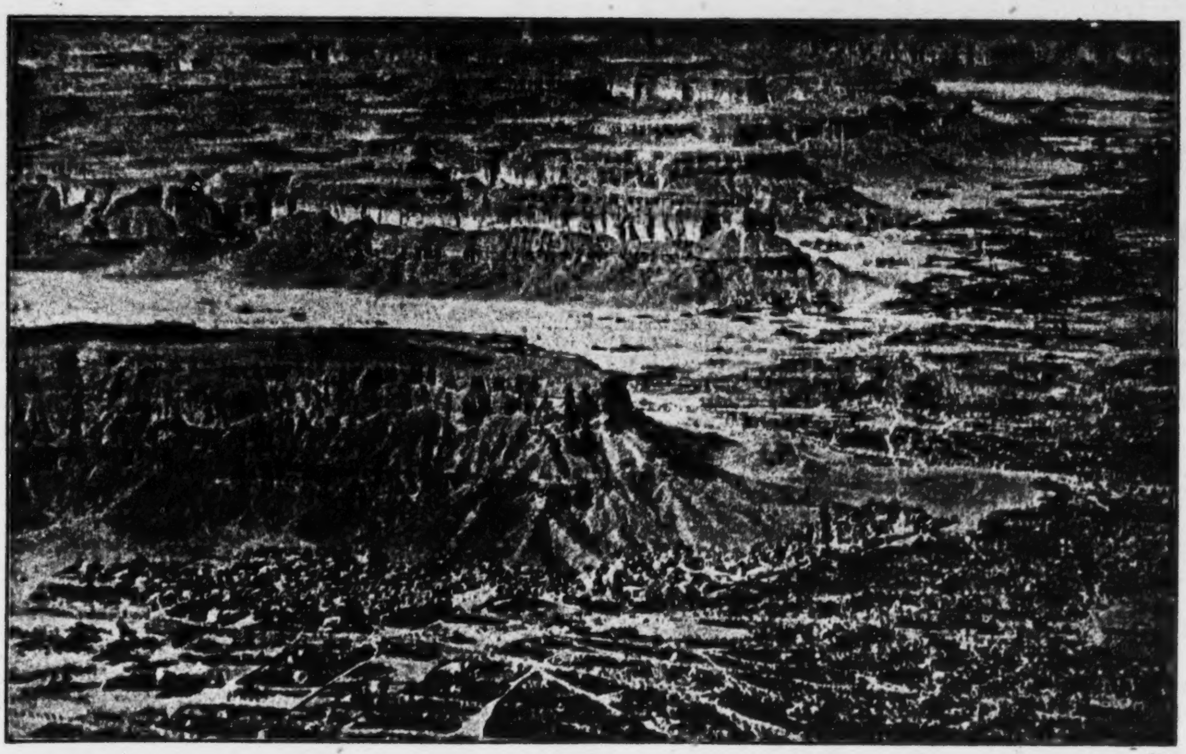
The border of the Qeʿēṭī territory is a quarter of an hour's 131
walk to the east of Shibām. There, high up at the edge of the 712
mountain, is a fort and an observation post; there are also mud block-houses in the plain. Somewhat further along the mountain's ridge the white military posts of the Āl Kathīr are visible.

On the afternoon of May 24th, immediately after leaving 721
Shibām, we cross the sandy wādī diagonally towards the northern side, where there is least vegetation, but also least warfare. The whole southern side has the name of being unsafe. But even here on the north, soldiers dog our footsteps
whenever we stop to take photographs. The villages are built 361
up against the mountain foot, and on higher points are the 312
ruins of fortifications. Following the margin we again enter/ 33
date plantations, which are, however, very thin and finally perish in the engulfing sand. Then we go on through sand-dunes overgrown with a kind of beach-grass. Close by Sēwūn we again have to cross the bed of the wādī, as this place is situated on the southern side. There is water, here and there, in the *sēl*-bed; it is, however, very bitter. The soil close to those stagnant pools is covered with a crust of white salt.

Sēwūn lies within a wide belt of magnificent palm-groves 241
and fields of *dhura*. The water-level is only eighteen to twenty-one feet below the surface; the water has a saltish taste, but appears to be exceptionally suitable for the irrigation of the gardens. We had not so far seen such vigorous date-palms and such luxuriant, tall-growing *dhura* as in this part of the country. The hot wind has already ripened the bunches of dates, which are comfortably hidden away by this time in their

p 119

Photo Royal Air Force Official crown copyright reserved.



Sēwūn, the heart of Ḥaḍramaut.

p120(A)

● 133

A pool in the *masīla* near Sēwūn, surrounded by a white salt-crust.

p 120 (B)

See page 119.

000 from our roof how they begin to stir on the other roofs close to us and then go down to the kitchen to light a fire for a cup of ginger coffee. There is a small grove of date-palms round es-Sōm, on either side of the *sēl*-bed, which is full of water. We wash and drink our fill at one of the wells before resuming our journey in the heat.

After about three hours we arrive at the village of Fughma, which consists of a few mud houses encircled by huts. It is scorchingly hot although still early in the day. Our escort declare that we must rest and eat here, as there is no other village and no water to be met with for the next four or five hours. We do not believe this and insist that we must go on, but they, as one man, refuse, warning us of the consequences of such folly, and promise to set out again after an hour's rest. We give in against our will, with the unpleasant feeling that we are being taken in and that we could quite well take the risk of going further. A kid is purchased from our host and is carefully prepared for a splendid meal. Fughma is the last stopping-place before Qabr Hūd, and a four hours' walk through barren country still awaits us.

312 With great difficulty we get the caravan going again at
●/33 two o'clock. We continue to follow the bed of the wādī, where we find water nearly everywhere! It is now the middle of the dry season; after the scanty rains or when the *sēls* rush down from the western mountains, then, at this point, the *mesīla*[1] of Wādī Ḥaḍramaut must have the aspect of a real river. Thus the British airmen from Aden reported truly when they said they had seen a river running through the wādī beyond Qabr Hūd. The river disappears under the surface of the soil, however, long before it reaches the Indian Ocean.

796 Close to Fughma we pass through small groves of palms with groups of miserable huts. This is the spot where the Bedouins of the neighbourhood come together once a year, to feast in pious memory of a holy man. Those are days of truce dedicated to God and trade. In Fughma we could hear

---

104 [1] A *mesīla* (مسيلة) is the bed of a *sēl*, a torrent, a streaming water.

6. THE TOMB OF THE PROPHET HŪD AND THE SILENT PILGRIMS' TOWN.

778 At last we see the white domes of Qabr Hūd and the buildings belonging to it, against the dark rock-wall. The wādī bends at a right angle towards the north; from the distance it almost looks as if it had no outlet and ends in a steep chasm between black rocks. About half an hour before we reach Qabr Hūd we come upon a square mud building on a flat-topped hill, in which a guard is posted. Our *muqaddam* maintains that we may only enter the town under the protection of this guard. We manage to arrange for our protectors to await the caravan and to go with it to the house in Shaᶜb Hūd (the Chasm of Hūd) where we are to spend the night.

778 And now we are making our way unaccompanied to the
● 133 goal which we had hardly dared to hope to reach. It is only thanks to Sayyid Abū Bakr that we, as the first Christian visitors, are allowed to enter this renowned sanctuary of Ḥaḍramaut. To approach it, my companion and I leave the road and go across country, each following what he thinks to be the shortest and best way. Wādī Barhūt here leads into Wādī Ḥaḍramaut. The thick layer of loess is, in many unexpected places, deeply cut into by water flowing away after rain. The banks of these dry *sēl*-beds are so steep that it costs time and effort to get through. The hills between them are covered with a layer of fine dust more than eight inches thick. A great number of bushes of *ᶜushar, rāk* and *ithl* make the landscape a charming picture of fresh green.

361 But our eyes turn towards the wonderful white buildings
778 that lie there before us, up against a grey-black precipice of rock, and towards the dead town lower down in the narrow ravine — the town which is only inhabited for three days in the year. The whole scene is much greater and more beautiful than we had ventured to picture it in our thoughts. The pure white buildings, destined for the cult of the saint, give the impression of being brand-new, and of being most devotedly

312

The first watering station on the *djōl* of the Deyyin.

●/33

The *djōl* of the Deyyin Bedouins.

facing p. 209

See pages 210 and 212

● 133 We mounted our camels on reaching the *djōl* and made
as fast as possible for the first halting place, where there was
drinking-water to be found. This *djōl* differed little in character
from that which we had crossed on our way to Wādī
Dōʿan. It is again the same flat, limestone plateau, thickly
strewn with sharp fragments of stone; through this winds
a similar narrow camel path. The view is limitless in every
direction; the characteristic, long chains of table-mountains
are absent here. Here and there we pass some dwarf trees,
crooked and gnarled. Deep silence reigns in this motionless
361 region. After some hours marching we saw, in a fold in the
land, a fortification built of rough stones with strong, square
312 towers at each corner. Some people are living in it, so there
must be water at hand, and it is high time, for our thirst is
becoming a torture. Not a living soul was to be seen, nothing
but a wall enclosing a square space, with towers rising up
out of it. Close by rain had conveyed some earth to a depression
in the ground, where there were some dried-up fields and
a few *nibq* trees, leafless and grey, with not a sign of green;
everything was monotonously grey and lifeless like the rocky
plain all around us. As we neared the settlement we saw a few
large *neqābas* and people drawing water from them. There had
been no rain for a long time and, consequently, the water-supply
in some of the *neqābas* was exhausted, whilst, in the
others, the water which had been stored in them for so long
had a brackish taste; in spite of this, we slaked our thirst with
it and filled our water-skins and thermos flasks. We dealt out
biscuits from our store to the poor, friendly inhabitants, who
were experiencing extra hard times on account of the long
drought. A small caravan from Makalla was also resting there.
438 Dried fish, principally small sharks, and rice were being carried
to Wādī ʿAmd, but the cost of transport appears to exceed
the market value of these articles in Makalla.

361 Our way continued over the *djōl* until we reached Sherdj
el-Abyaḍēn Bā Manṣūr, where we rested for the afternoon.
Here we saw the same picture of drought and poverty. The

133

The descent to Wādī Yebʿeth.

p. 216 (A)

See page 217.

Panorama of Wādī Yeb'eth.

p 216 (D)

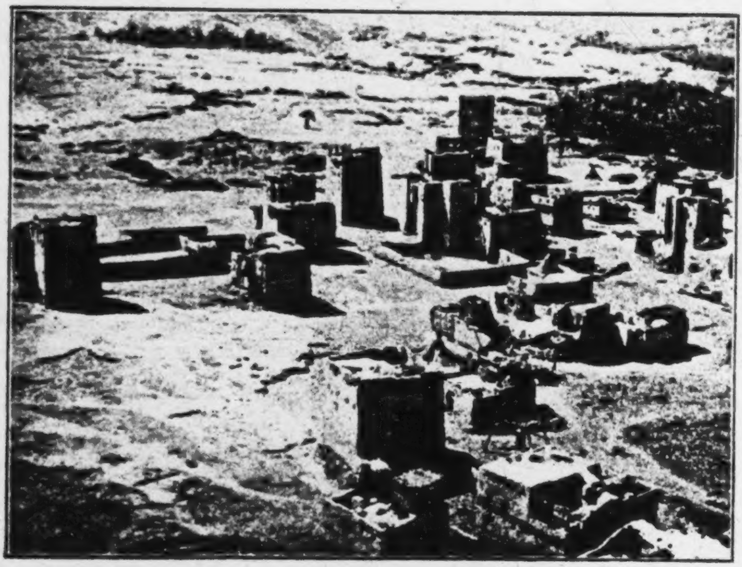
000 air that we were nearing the coast and Wādī Ḥadjr, where there is always water. Our clothes and other things were already damp by the time the sun rose.

Not till twelve o'clock did we halt in a sweltering wādī under the shade of a boulder which radiated heat. An effort of will was necessary to get us under way again, towards half past two. We went on in silence, avoiding speech with each other, as the energy which makes for friendliness and gaiety
● 133 was lacking. We pass through a region very interesting from a geological and botanical point of view. The *djōl* ends here and a broken, uneven area of rock and wādī takes its place. The direction of the strata, until now uniformly horizontal, is disturbed and new strata of coal-black rock formation break a way through the layers of limestone and sandstone and sometimes rise up above them like solitary cones. There is more water, but it contains a high percentage of salt. We go through jungles of grass, several feet high. Here and there the ground is swampy and covered with a crust of salt; a tall, slender palm-tree of a kind we have not hitherto come across grows in this salty marsh land. Later on we come again to
361 barren stretches covered with boulders. To our amazement
312 we found no human settlements here: we only saw people when much farther on, by the thickly-grown banks of a shallow but swift-flowing river. This turned out to be the upper reaches of Wādī Ḥadjr. The water was very warm and bitter. The sun was already setting when we crossed the stream and hastened on to reach Ṣidāra before nightfall, but before long we saw the scattered stone houses of this large village lying on the hilly banks of the wādī. Here cultivation begins again: fields of sesame and *dhura* alternate rapidly with gardens of date-palms. Vigorous springs throw up water which is nearly boiling; this water is carried to the fields and date plantations. The conduits have been made of such a length that the water is sufficiently cool by the time it reaches the plants, but even so it is still very warm. We noticed a white deposit in the conduits.

133

Peaks of black stone piercing the lime- and sandstone strata near Wādī Ḥadjr.

361



Ṣidāra, situated at the beginning of the cultivated area in Wādī Ḥadjr.

facing p. 224

See pages 222 and 22

312 Ṣidāra. The high temperature of the water does no harm
273 to the vegetation as can be seen by the thick and almost
245 tropical growth even at the sources of these hot streams. The
picture made by this landscape in the midst of the deserts of
rock was quite new to us. New to us also was the custom,
which exists here, of tapping sap from the palm-trees: this
sap soon ferments and produces a by no means innocent
[538] drink which is consumed in large quantities. Artless tales were
told us of many a man who had become a regular slave of
the wine of the date-palm. That this abuse of the date-palm,
so strongly condemned by orthodox Muḥammadan opinion,
does not seem to exist in other districts through which we
travelled, is probably due rather to poverty than to religious
conscientiousness. The people only indulge in the luxury of
this sin in the well-watered country of Wādī Ḥadjr, where date
plantations succeed each other continuously for hours and
even days.

312 We had a bathe in one of the warm springs, a comfort
133 lacking since Diyār Āl Buqrī; but the crowded circle of
critical and youthful spectators and their mocking remarks,
added to the somewhat too high temperature of the water,
prevented complete enjoyment of the event.

These hot springs point to volcanic action. Ṣidāra lies on the edge of the coastal chain of mountains, which is full of clear traces of volcanism. The monotonous similarity of the *djōl* and *wādī* formation of the interior has disappeared. The geological strata are no longer horizontal, nor do they consist any longer of limestone and sandstone and loam. Fantastically folded and broken strata, high precipices and peaks of archaic rock, between which extinct volcanoes can be recognised, characterize the landscape between Ṣidāra and Makalla.

000 The necessary waiting for camels and escort gives us the opportunity to write up our diaries, which has been pushed aside lately by other and more urgent affairs; but although our host does his best to give us the chance of a few hours' quiet work in a room upstairs, he does not succeed in doing so.

000 before we got our caravan on the move. A disappointment of this kind does not improve the mental atmosphere, especially before one has learnt to know one's followers. Distrust of the honesty of their promise to do all in their power, and the overwhelming desire to go quickly forward on account of the scantiness and bad quality of our food bred in us a mood of tension and exhaustion.

133 The mountain scenery through which we passed became
312 gorgeous. The geological strata were clearly visible in the
712 walls of the dry river-beds through which our path ran. Before us was a lofty chain of granite mountains like a huge wall with sharp peaks and jagged tops. It grew very warm among those bare rock-walls where we had to climb laboriously over sharp, slippery ground. To one side of the path was a brackish spring of whose water even the animals refused to drink. We mounted towards the high mountain-pass which our people called Hūta. The remains of a strongly fortified wall built of fragments of uncut stone stand in the pass. Heavy fighting took place there ten years ago when
[764] el-Qe'ēṭī sent an expedition to conquer Wādī Ḥadjr. The graves of the slain are marked by simple heaps of stones, on either side of the mountain path. After a long descent we reached the wādī again at just about the hottest time of day. Its banks here are steep and so we could not get at the enticing water or the green *rāk* bushes, but our Bedouins went in search of a place where it would be possible
000 to descend. We had made up our minds to rest for the afternoon, not here in el-Qulēta, but further on at Nēfa. The intense desire to hurry on at all costs and to get to the end made Von Wissmann and me decide foolishly to force matters and, if need be, to walk alone to Nēfa without the caravan. The path wound on through a region of sand-hills and the heat was so great that we became uneasy over our decision. Luckily Dhēb had the magnanimity to give way and gave the order to follow us. Nor had we trusted in vain to Little's map, for Nēfa was close at hand. Near the path was a great

133

Granite walls in the coastal mountain-range.

Hūte, where the Qeʿēṭī troops fought a hard struggle.

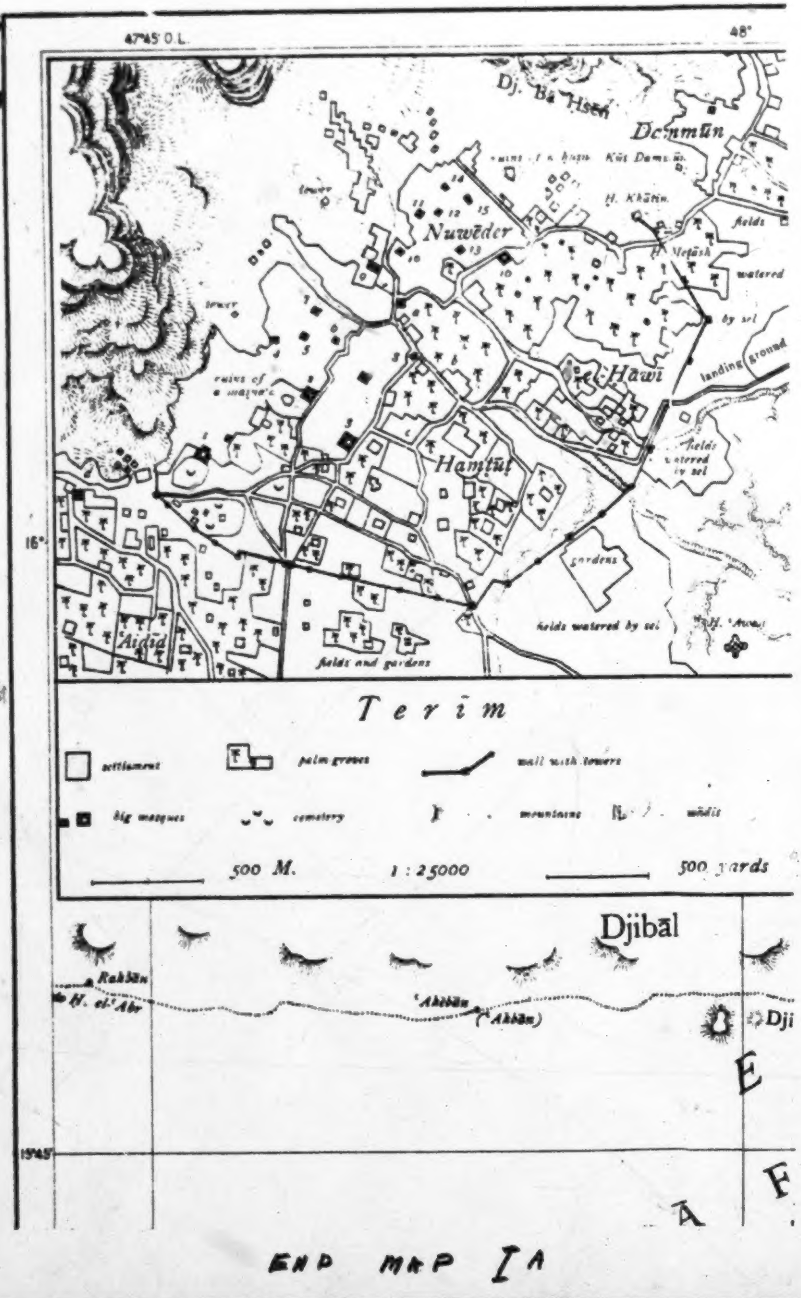
facing p 233

36/
102
487
133

IA	IB	IC	ID	IE	IF
IIA	IIB	IIC	IID	IIE	IIF
IIIA	IIIB	IIIC	IIID	IIIE	IIIF
IVA	IVB	IVC	IVD	IVE	IVF
VA	VB	VC	VD	VE	VF
					VI

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

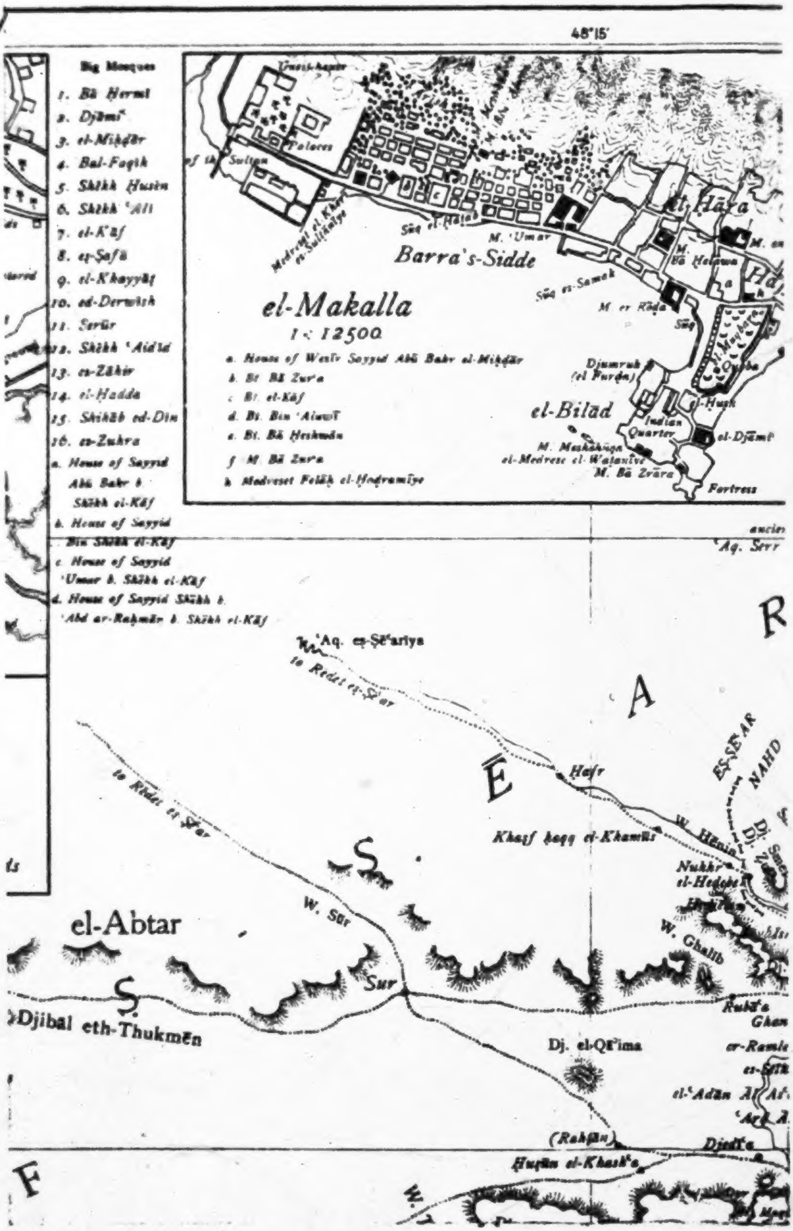
361
102
487
●133


47°45' O.L.
48°
16°
15°45'
Dj. Ba Hsen
Demmūn
Kūt Demmūn
H. Khātin
H. Metāsh
Nuwēder
tower
ruins of a mosque
el-Hāwī
Hamṭūt
'Aidīd
fields
watered by sel
landing ground
fields watered by sel
gardens
fields watered by sel
fields and gardens
H. 'Awād
Terim
settlement
palm groves
wall with towers
big mosques
cemetery
mountains
wādis
500 M.
1 : 25000
500 yards
Djibāl
Rahbān
H. el-'Abr
'Akbān
('Akbān)
Dji
E
F
A

END MAP I A

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

361
122
487
123

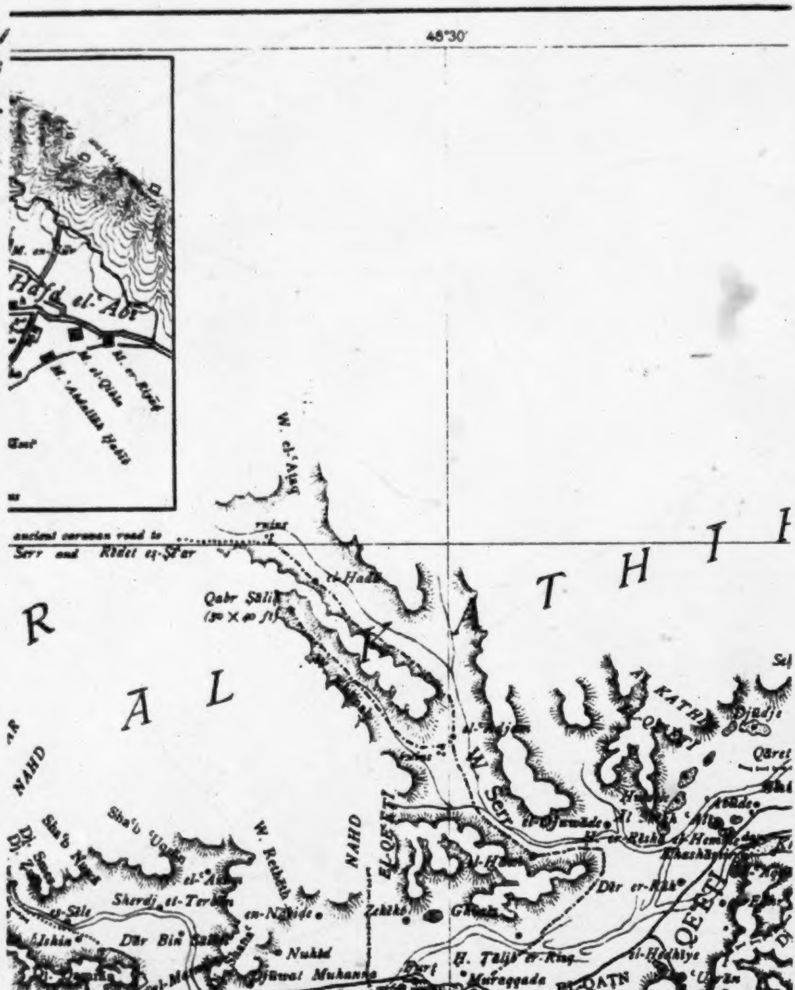

48°15'
Big Mosques
1. Bā Hermi
2. Djāmiʿ
3. el-Miḥḍār
4. Bal-Faqīh
5. Shēkh Ḥusēn
6. Shēkh ʿAli
7. el-Kāf
8. eṣ-Ṣafā
9. el-Khayyāṭ
10. ed-Derwīsh
11. Serūr
12. Shēkh ʿAidīd
13. eẓ-Ẓāhir
14. el-Ḥadda
15. Shihāb ed-Dīn
16. ez-Zuhra
a. House of Sayyid Abū Bakr b. Shēkh el-Kāf
b. House of Sayyid Bin Shēkh el-Kāf
c. House of Sayyid ʿUmar b. Shēkh el-Kāf
d. House of Sayyid Shēkh b. ʿAbd ar-Raḥmān b. Shēkh el-Kāf
Palace of the Sultan
Medresat el-Khairīye es-Sulṭānīye
Sūq el-Ḥaṭab
M. ʿUmar
Barra's-Sidde
el-Makalla
1 : 12500
a. House of Wezīr Sayyid Abū Bakr el-Miḥḍār
b. Bt. Bā Zurʿa
c. Bt. el-Kāf
d. Bt. Bin ʿAlawī
e. Bt. Bā Heshmān
f. M. Bā Zurʿa
h. Medreset Felāḥ el-Ḥaḍramīye
el-Ḥāra
M. Bā Helēwa
Sūq es-Samak
M. er Rōḍa
Sūq
Djumruk (el Furḍa)
el-Bilād
Indian Quarter
el-Djāmiʿ
M. Maṣḥaḥūn
el-Medrese el-Waṭanīye
M. Bā Zrāra
Fortress
ʿAq. Serr
ʿAq. eṣ-Ṣeʿarīya
to Redet eṣ-Ṣēʿar
R
A
Ē
S
Ḥafr
ES-SEʿAR
NAHD
Khaṣf ḥaqq el-Khamīs
W. Ḥenin
Nukhr el-Ḥedebe
W. Ghalib
W. Sūr
to Redet eṣ-Ṣēʿar
el-Abtar
Sūr
Djibāl eth-Thukmēn
Dj. el-Qiʿima
Rubʿa
er-Ramle
el-ʿAdān
(Rahḥān)
Djedʿa
Ḥuṣūn el-Khashʿa
F

END MAP IB

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

249 (3)

361
487
102
● 133

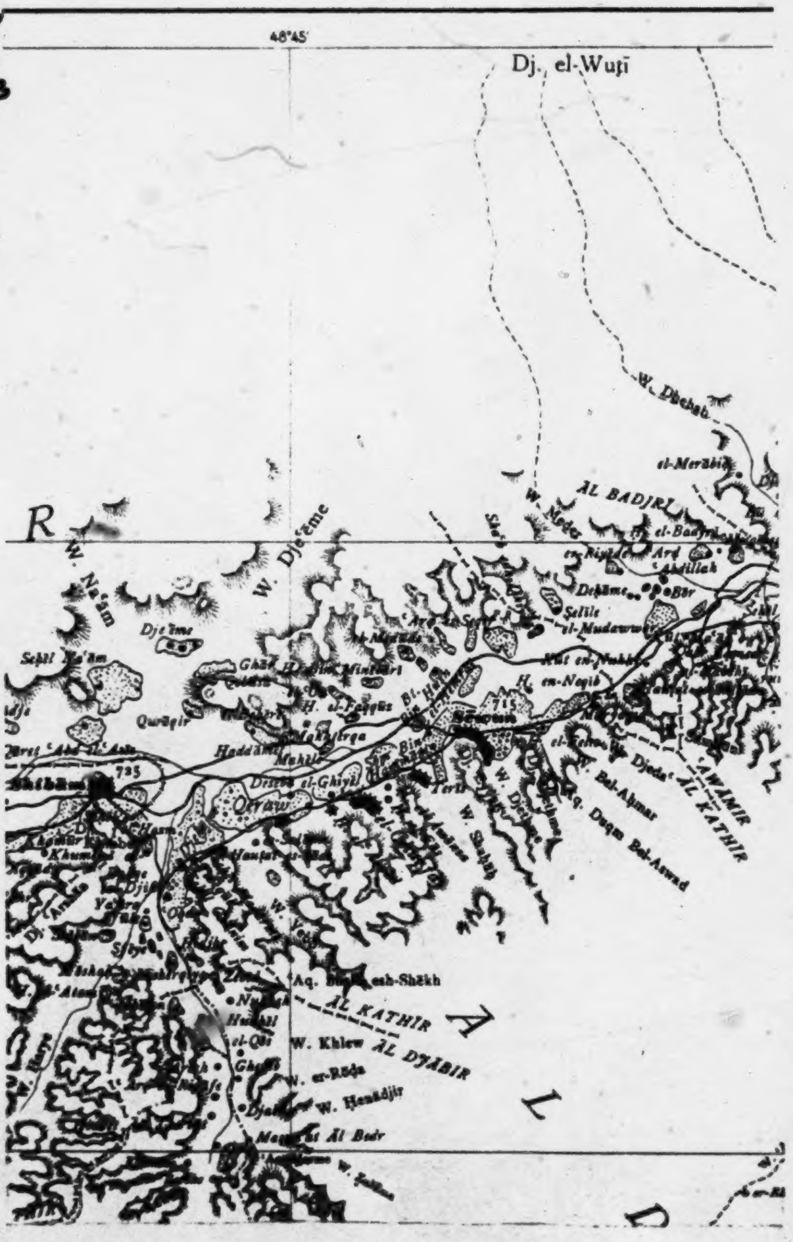

48°30'
Hafd el-Abr
M. er-Rijāl
M. el-Qiblo
M. 'Abdallāh Ḥalīl
ancient caravan road to
Serr and Rōdet eṣ-Ṣe'ar
ruins
W. el-'Ayn
el-Hadj
Qabr Ṣāliḥ
R
A
L
A
T
H
I
KATHI
Sel
Djadje
Qāret
NAHD
Sha'b 'Ugde
W. Reikeh
NAHD
EL-QE'ETI
W. Serr
el-Djuwāde
Dūr er-Rīk
el-'Akam
Sherdj el-Terkān
es-Sīle
en-Nāhde
Zeḥtko
Ghoṭa
Dūr Bin Sahel
Nuhid
Djuwat Muhanna
H. Ṭālib er-Rieg
Muraqqada
EL QATN
el-Hedhiye
QE'ETI
Henin
Ghanīmat el-'Abri
el-Munṣūra
Sherdj Āl
el-Hawta
Zergane
-Ramle
Bā Ḥassān
Āl Kuwēr
el-Bāṭine
Ba'wd
(Tuhālī)
(Shabīn)
(Quaibī)
es-Suhaliye
Shand
Sfūlet Āl Hamūl
el-Meghōr
Āl Afif
Harīt
Mefqat el-'Abri
villages
in entrance
of wadi
el-Fadl
el-Kelib
Ḥadjarīn
EL
W. Ha
1280
1410

END MAP IC

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

249 (4)

487
102
● 133

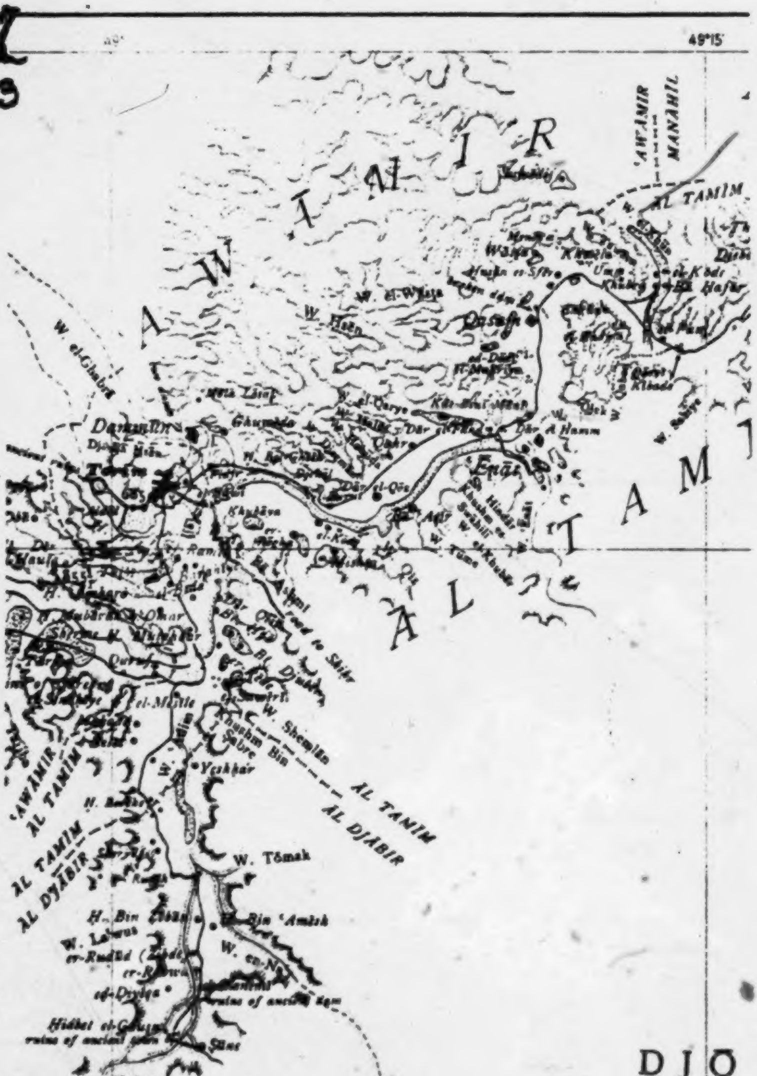

48°45'
Dj. el-Wuti
W. Dhehab
el-Merābid
AL BADJRI
W. Neder
el-Badjri
Ard Abdillah
Dhāme
Bōr
Sellile
el-Mudawwara
en-Neqib
R
W. Na'am
W. Dje'eme
Dje'eme
Sehil Na'am
Ghār
H. el-Faggūs
Qurāqir
Haddānī
Mahile
725
715
Shibām
Seyūn
Derein el-Ghiyal
Qerawi
Terīm
W. Shibith
W. Djeime
el-Tehne
Djeda'
W. Bel-Ahmar
Aq. Duqm Bel-Aswad
AL KATHIR
'AWAMIR
Aq. Bir esh-Shēkh
AL KATHIR
W. Khlew
AL DJABIR
W. er-Rōda
W. Henādjir
el-Qōz
Masna'at Āl Bedr
A
L
D

END MAP ID

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

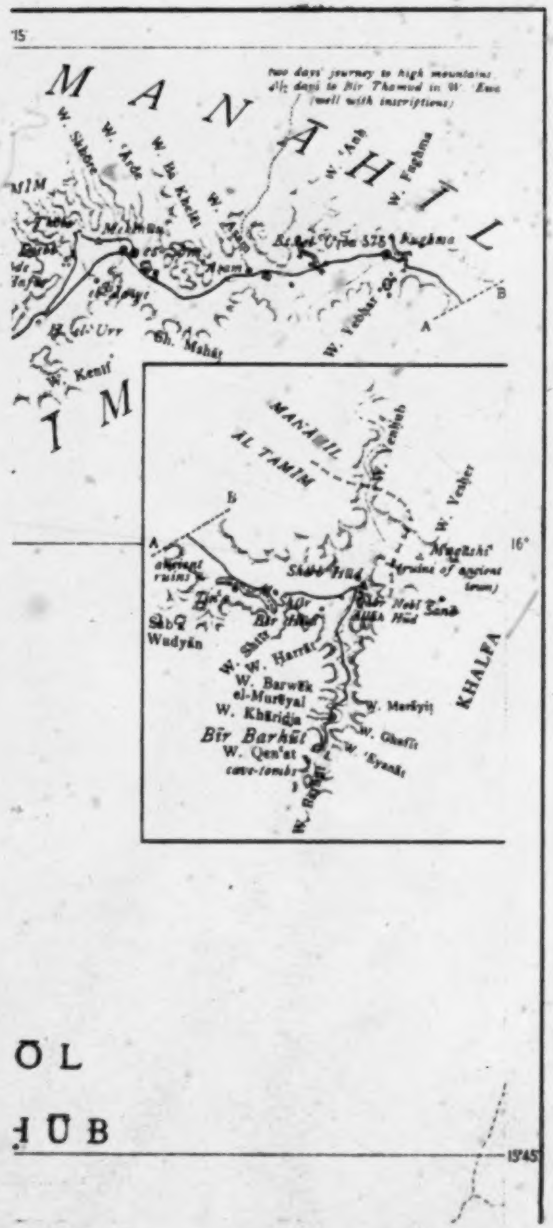
249 (5)

487
10a
133


49°
49°15'
'AWĀMIR
'AWĀMIR
MANĀHIL
ĀL TAMĪM
ĀL TAMĪM
W. el-Ghabra
Damūn
Terīm
W. Hēn
Dūr el-Qōz
Dār A Hamm
Enāt
road to Shihr
W. Shemlān
ĀL TAMĪM
ĀL DJĀBIR
ĀL TAMĪM
ĀL DJĀBIR
Yeshbar
W. Tōmah
W. Lahwus
W. Bin 'Amēsh
ruins of ancient dam
Hidbet el-Ghuraz
ruins of ancient town
Hakmē
Tamrān
DJŌ
ISHI

END MAP IE

487
102
● 133

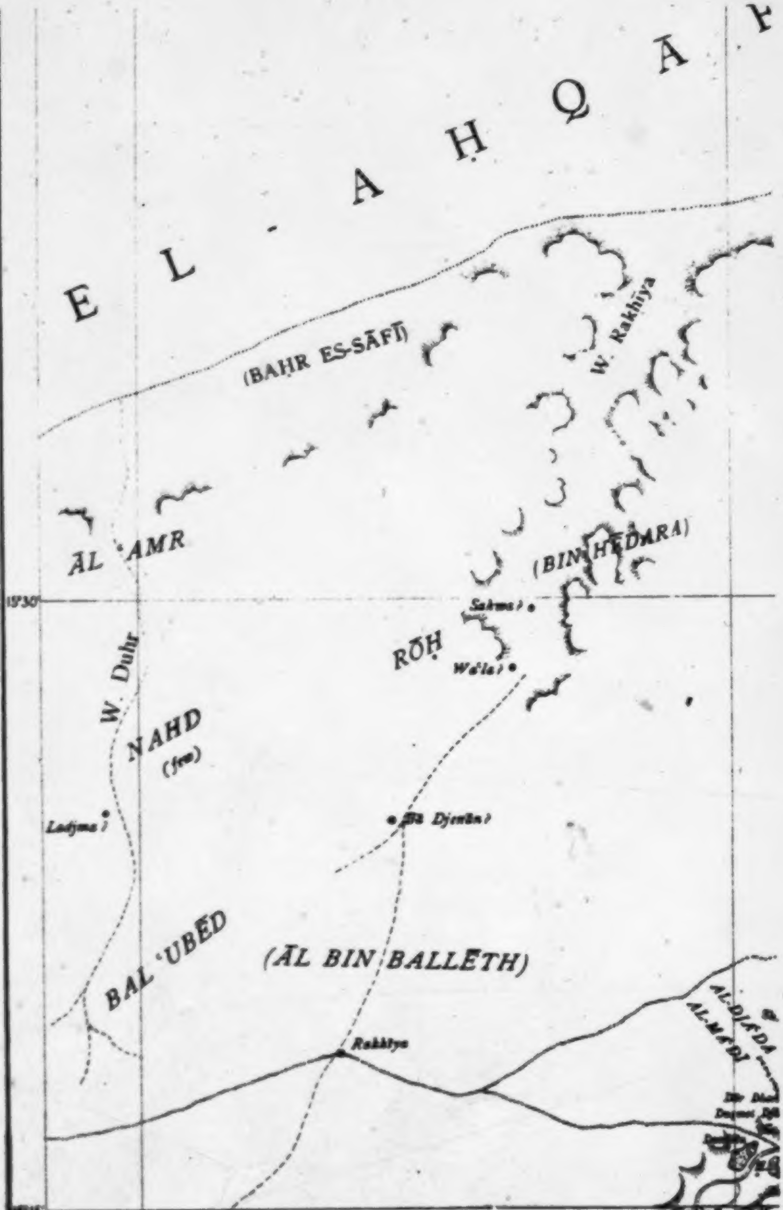

15
two days' journey to high mountains
4½ days to Bir Thamud in W. 'Ena
(well with inscriptions)
M A N A H I L
W. Shibre
W. 'Ade
W. Bā Khalef
W. 'Anb
W. Faghma
Meshhūn
Kughma
W. Veshbar
A
B
W. el-'Urr
W. Kenif
I M
MANAHIL
AL TAMIM
W. Yenbuh
W. Vesher
16°
ancient ruins
Shibe Hūd
Qabr Nebī Allāh Hūd
Bir Hūd
ruins of ancient town
KHALFA
Sab'a Wudyān
W. Sheta
W. Harrat
W. Barwēk el-Mureyal
W. Khāridja
Bīr Barhūt
W. Qen'et cave-tombs
W. Markyit
W. Ghafli
W. 'Eyanāt
Ō L
H Ū B
15°45'

END MAP IF

24:Meulen and Wissmann T-3 (1931) 1932 MM2 Hadhramaut MM2

249 (7)

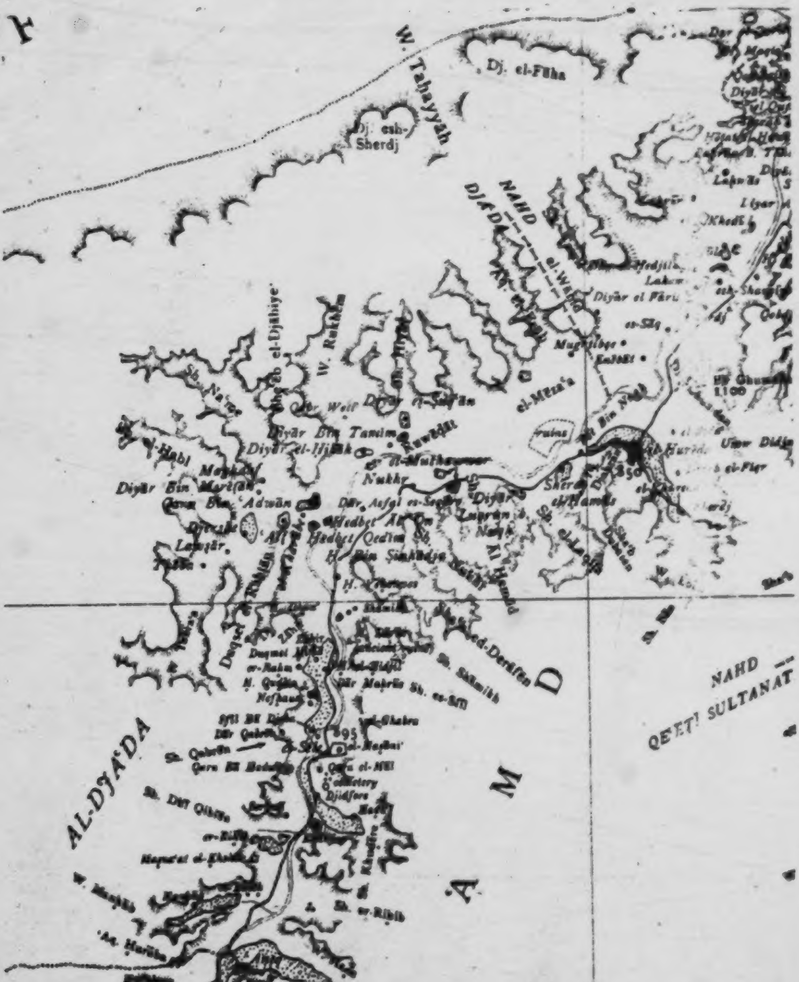
102
487
● 133


E L · A Ḥ Q Ā
(BAḤR ES-SĀFĪ)
W. Rakhiya
AL ʿAMR
(BIN HEDARA)
15°30'
Sakma?
RŌḤ
Waʿla?
W. Duhr
NAHD
(frei)
Ladjma?
Bir Djenān?
BAL ʿUBED
(ĀL BIN BALLETH)
AL-DIʿĀDA
AL-MAḌĪ
Rakhiya
15°15'

END MAP II A

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

102
487
• 153 X

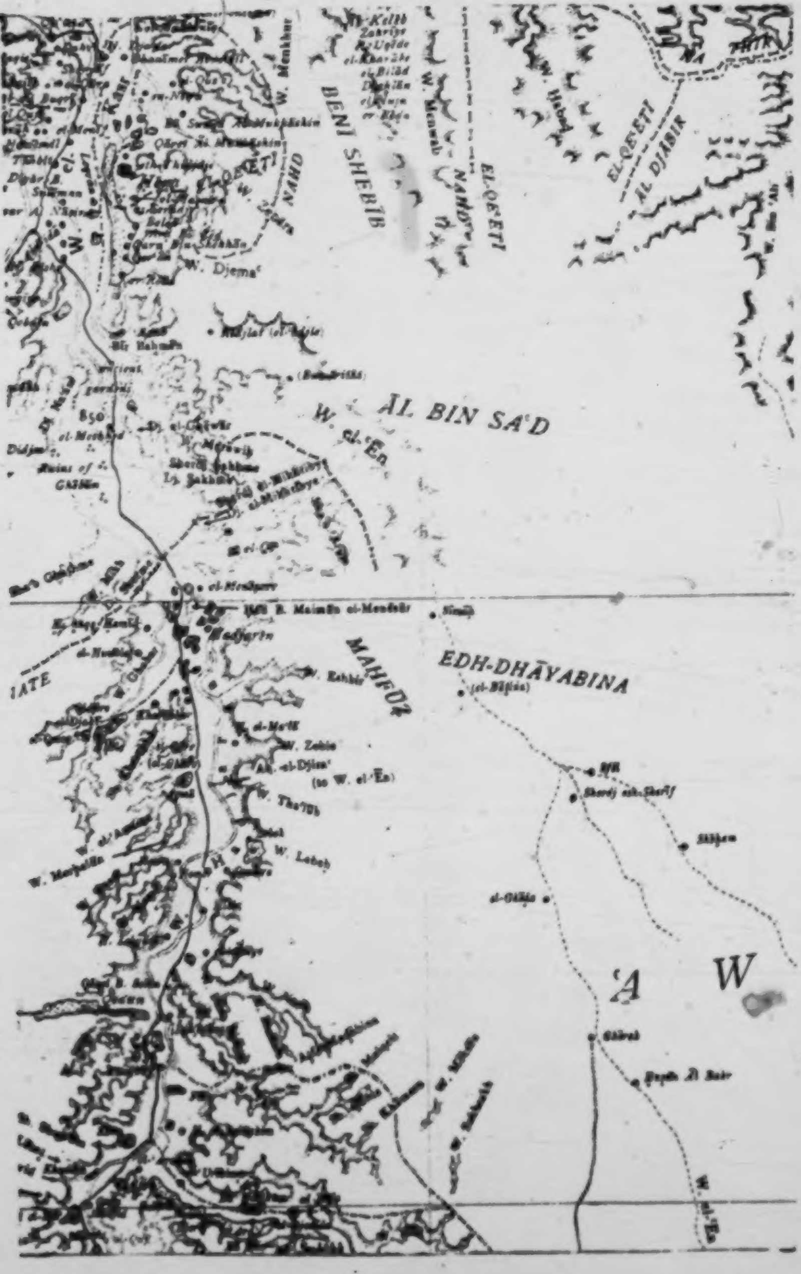

Dj. el-Fûha
Dj. esh-Sherdj
W. Tahayyah
NAHD
DJA'DA
el-Wadi
Diyâr el Fâri
Diyâr Bin Tamîm
Diyâr el-Ijjâlik
Nukhr
el-Mûza'a
Sheradj
Diyâr Bin Marîfân
Qarn Bin 'Adwân
W. Rukhân
Bin Sinkûdja
AL-DJA'DA
NAHD
QE'ETI SULTANAT
D
M
A
W.
'Aq. Kilîte
W. Qaifa

END MAP II B

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

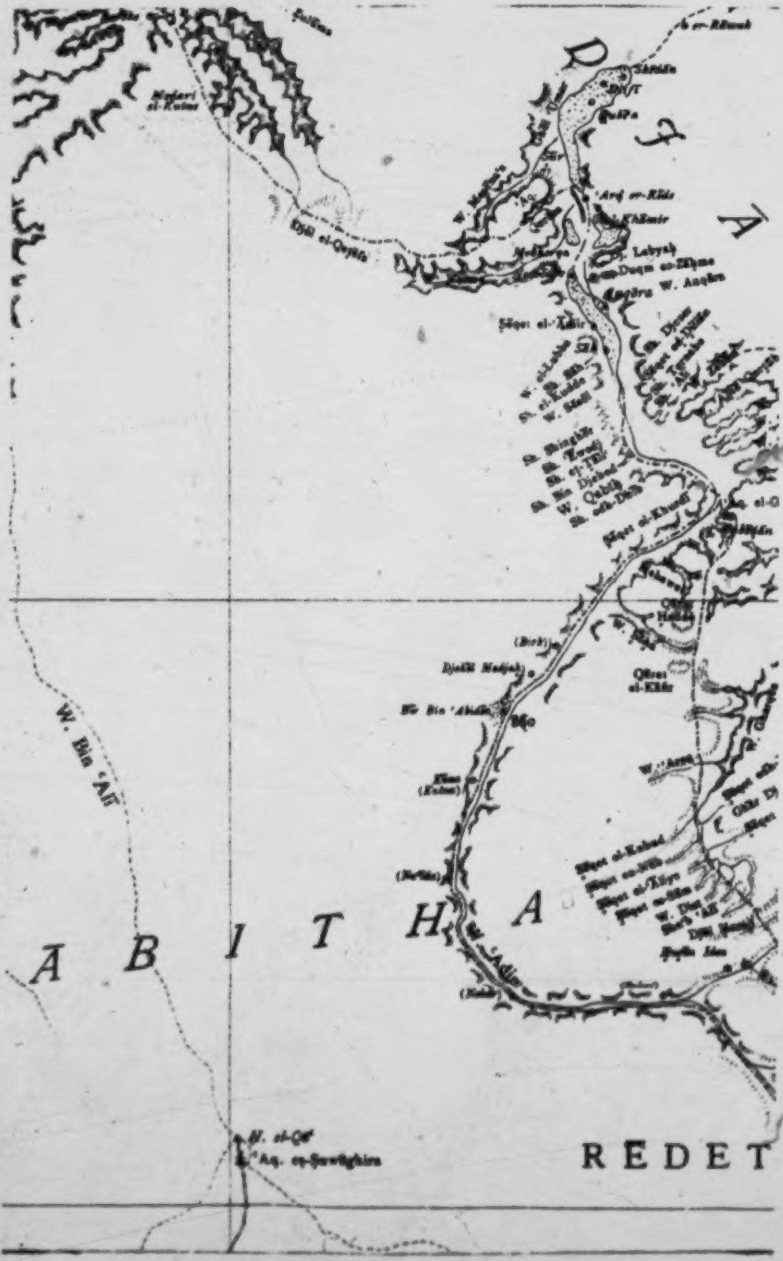
249 (9)

102
487
133


BENI SHEBĪB
NAHD
EL-QE'ETI
AL DJĀBIR
ĀL BIN SA'D
W. el-'En
EDH-DHĀYABINA
MAHFŪZ
Hadjarēn
W. Djema'
W. Leben
'A
W

END MAP II C

102
487
135

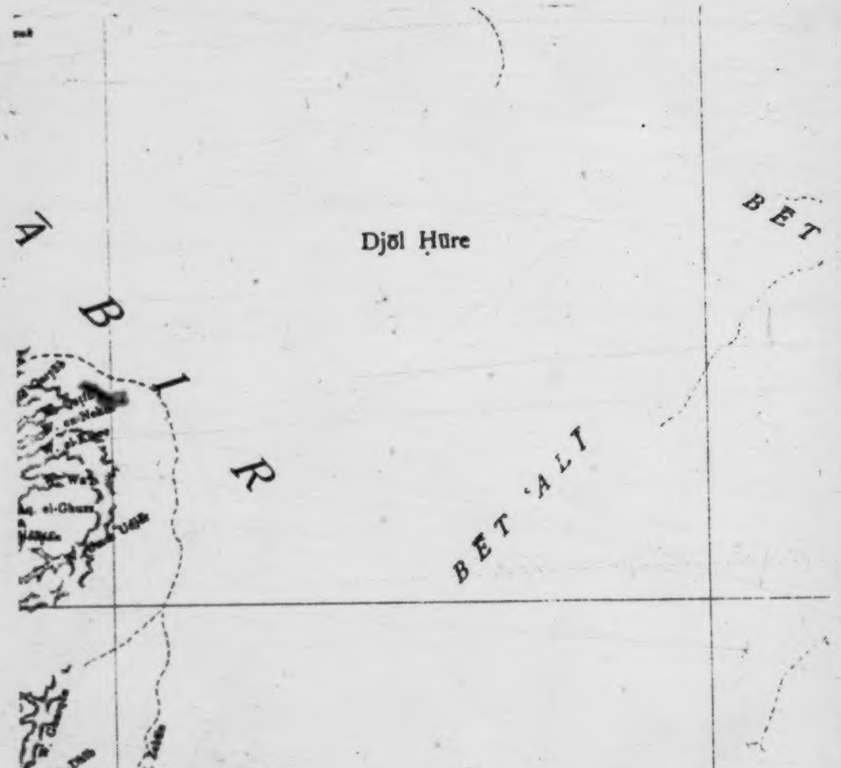

D
A
W. Bin 'Alî
Djôl el-Qoyûb
A B I T H A
H. el-Qâ'
'Aq. eṣ-Ṣawâghira
R E D E T

END MAP II D

24: Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

249 (11)

102
487
133

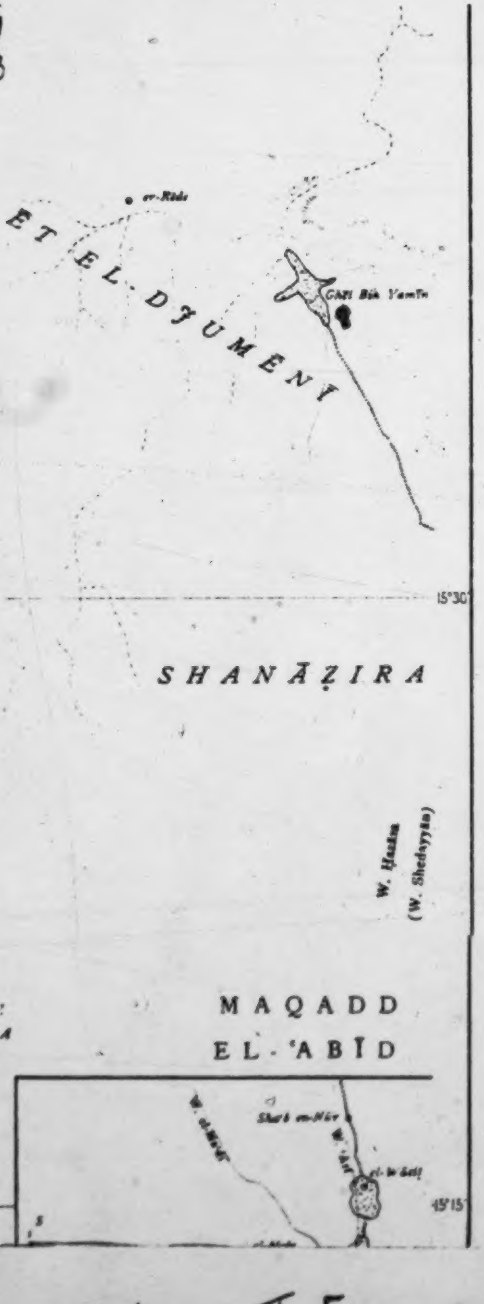

Djōl Ḥūre
ĀBIR
BET ʿALĪ
BET
ḤUMUM
DJŪHIYĪN
Clans of
EL-ḤUMUM:
BET ʿALĪ
BET ʿUMAR
BET QIRZĀT
BET SAʿĪD
BET EL-DJUMENI
BET GHURĀB
BET BĀ ṢALIḤ
BET EL-AḤMEDĪYE
BET ESH-SHAʿĀMILA
EL-DJŪHIYĪN,
BET EL-MAʿARA,
BET AGHRĀF,
BET ṢUBḤI,
BET ḤURR,
BET ḤAKAM,
BET BĀ WAKĪ,
W. ʿAdim
T

End map II E

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

249 (12)

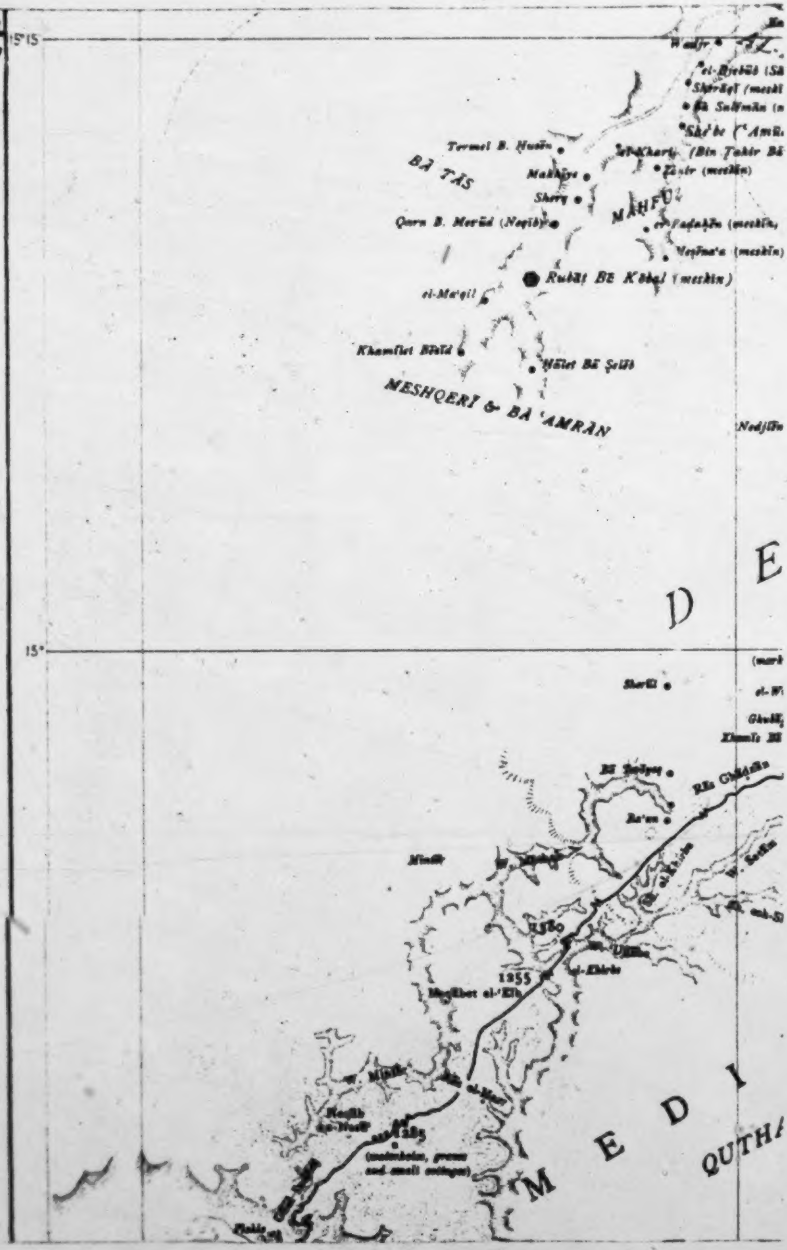
102
487
● 133


er-Rîde
ET EL-DJUMENI
Ghîl Bin Yamîn
15°30'
SHANĀẒIRA
W. Ḥaṣṣa
(W. Shedayyân)
MAQADD
EL-'ABĪD
Sharb en-Nûr
W. 'Arf
15°15'

End map II F

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

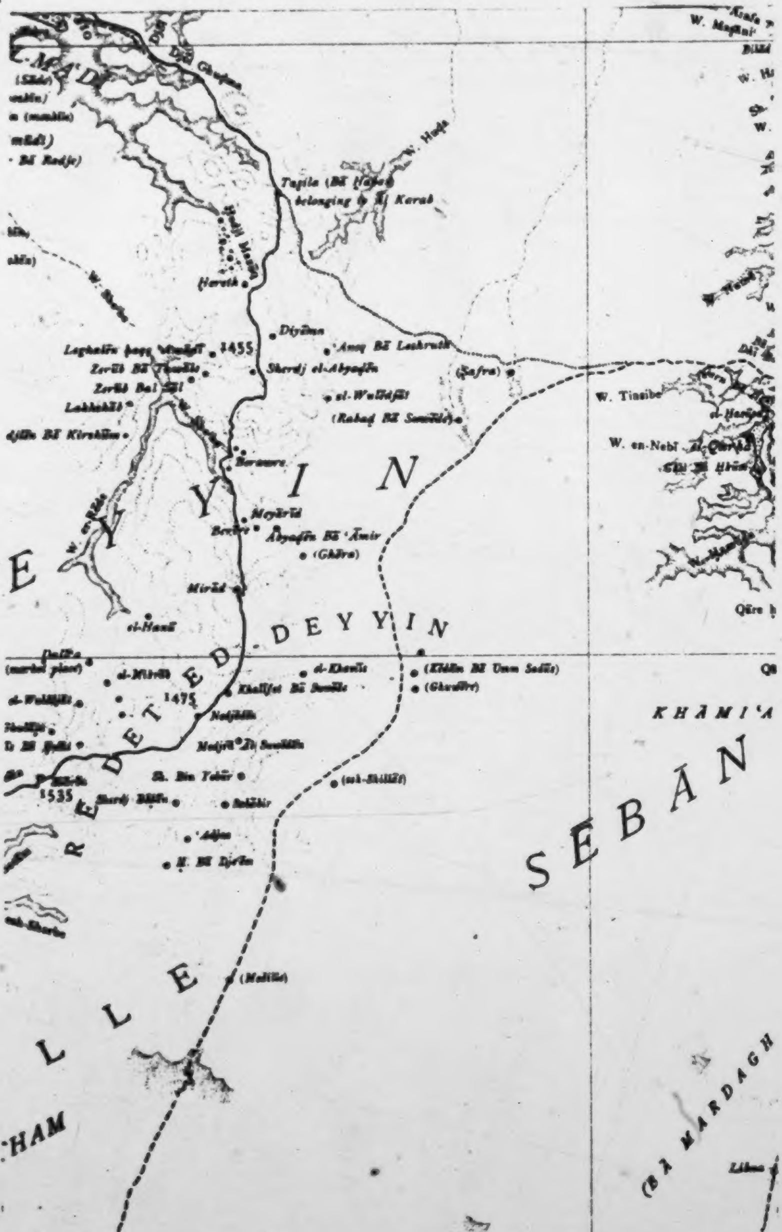
102
489
133


15°15
15°
Wadjr
el-Ḥjebūb (Sā
Sherāḥī (meskī
Bā Sulēmān (m
Shā'be ('Amū
el-Kharṭ (Bin Ṭahir Bā
Zāhir (meskīn)
Termel B. Ḥusēn
BĀ TĀS
Makhiye
Shery
Qorn B. Merūd (Neqīb)
MAHFŪ
eṣ-Ṣadaḥān (meskīn,
Neṣīma'a (meskīn)
Rubāṭ Bā Kōbal (meskin)
el-Ma'qil
Khamīlet Bōlū
Ḥālet Bā Ṣelīb
MESHQERI & BĀ 'AMRĀN
Nedjīlīn
D E
Sherīl
Bā Ṣeḥre
Ba'en
Rās Ghāḍīla
1380
1355
285
M E D I
QUTHA

END MAP III A

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM^2

102
497
133

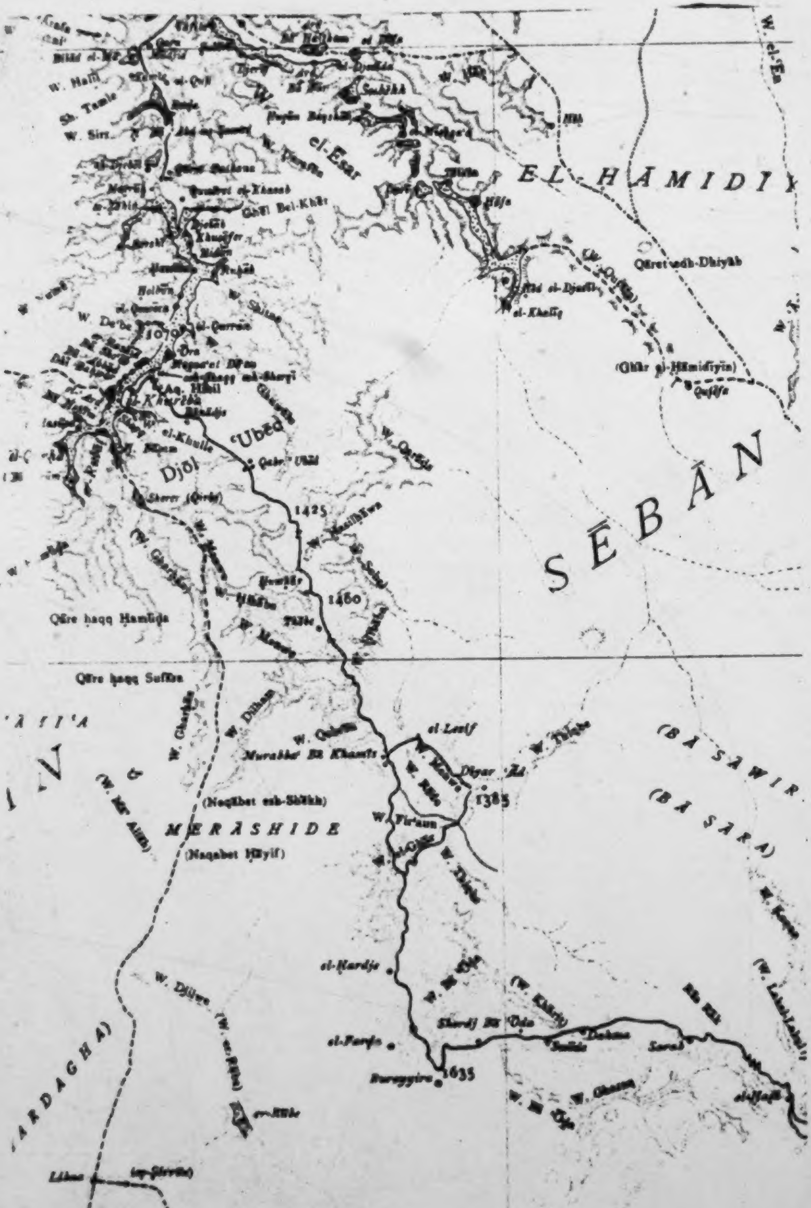

Dōʿān
Ghafūna
W. Hadj
Tafīla (Bē Ḥafe)
belonging to Āl Karab
Ḥarēth
W. Sherbe
Diyūma
Leghalīn ḥaqq ʿAmūdī
1455
ʿAnaq Bē Leshruth
Zerīb Bē Thuālē
Sherdj el-Abyaḍīn
Zerīb Bal Sāl
Lakhahīl
el-Wulīdjīl
(Rabaḍ Bē Sewīde)
djīlē Bē Kirshūm
(Ṣafra)
Berawre
Meyūrīd
Bevīre
Abyaḍīn Bē ʿĀmir
(Ghāra)
Mirūd
el-Ḥanū
E Y Y I N
DEYYIN
REDETED
(marbel place)
el-Mitrūb
el-Khawīs
(Khēlīn Bē Umm Sadūs)
(Ghadīre)
el-Wulīdjīt
Khalīfat Bā Sewīde
1475
Nadjīdīn
Madjrē Āl Sewīdīn
Sh. Bin Yabūr
(esh-Shillīt)
1535
Sherdj Bālīn
Sehābir
ʿAdjūn
H. Bē Djirūn
esh-Sharbe
W. Mashal
W. Tinsibe
W. en-Nebl
Qāre
KHĀMIʿA
SEBĀN
(BĀ MARDAGH
LLE
HAM

END MAP III B

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

249 (15)

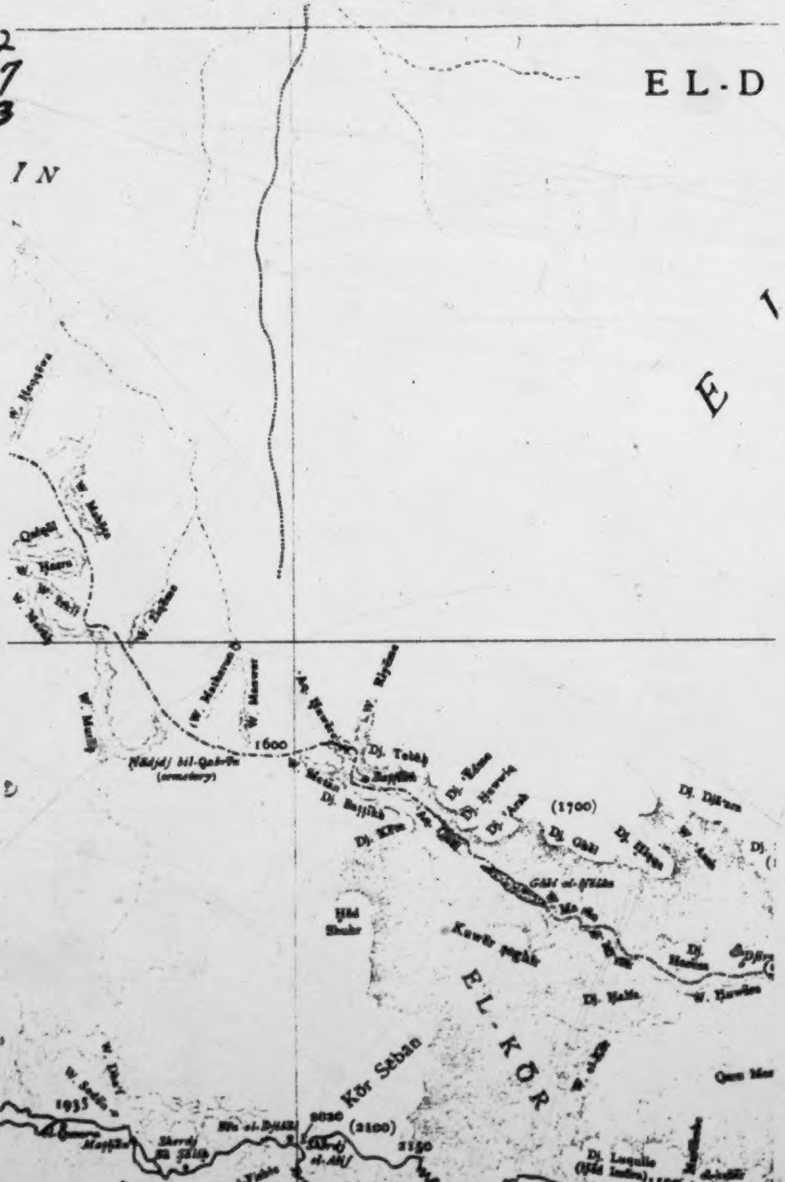
102
487
●173



EL-HAMIDIY
W. el-Esr
Qāret edh-Dhiyāb
(Ghār el-Hāmidiyin)
SĒBĀN
'Ubēd
Djōl
el-Khurēba
1070
1425
1460
Qūre haqq Hamūda
Qūre haqq Sufūn
Murabba' Bā Khamis
(Naqabet esh-Shēkh)
MERĀSHIDE
(Naqabet Hāyif)
el-Leeif
Diyar Āl
1385
W. Fir'aun
(BĀ SĀWIR
(BĀ SĀRA)
el-Hardje
el-Farfa
1635
Dahme
Sarab
(ARDAGHA)

End map III C

102
487
133

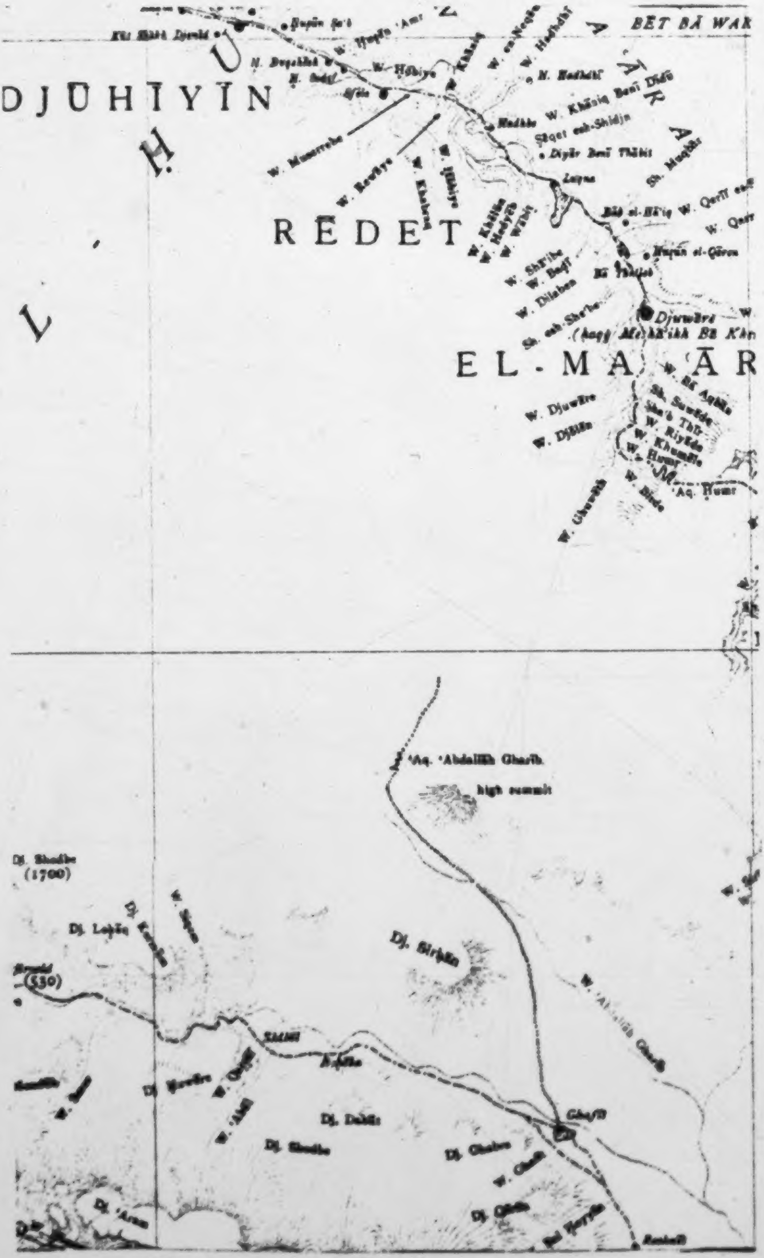

E L · D
I N
E I
W. Hoqaira
W. Mahlija
Qabali
W. Haura
W. Seifi
W. Zahma
W. Mahara
W. Masrar
W. Mutl
1600
Hadjdj bil-Qabrin
(cemetery)
Dj. Talab
Baglin
Dj. Bagjika
Dj. Kfu
Dj. 'Edna
Dj. Hawwia
Dj. 'Ard
(1700)
Dj. Ghbl
Dj. Djiv'am
Ghbl el-Hidda
Hild
Shahr
Kawkr Sagha
Dj. Hanua
W. Hawba
Dj. Halfa
EL · KŌR
Kōr Sebān
Qaru Mar
W. Dauf
W. Sedda
1935
Maffiha
Shirdj
Bir el-Djidda
Shirdj el-Ahf
2020
(2100)
2150
1465
el-Hjik
Dj. Luqulle
(Hild Iedra)
1500
2180
920
W. Majara
W. el-Yabis
(Dj. Zuhra)
W. Qupah
Hauwra

End map III D

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

249 (17)

102
487
● 133

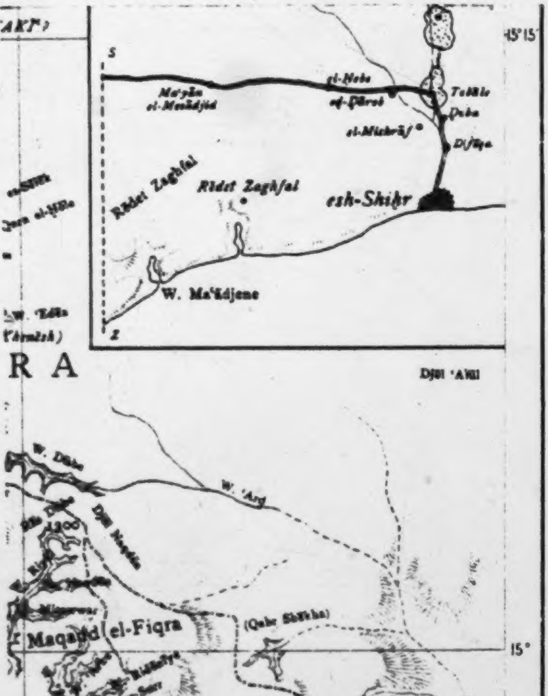

DJŪHĪYĪN
ḤUWĀR
REDET
EL-MAʿĀR
BĒT BĀ WAR
W. Musarrebe
W. Rewḍye
W. Khabeyd
W. Hibiye
W. Shiʿibe
W. Bedf
W. Dilaben
Djuwāre
W. Djuwāre
W. Djilāz
W. Khumbe
W. Humr
ʿAq. Humr
W. Ghuwaḍa
W. Riyāda
Sh. Sawāde
Sh. eḍ-Shebe
ʿAq. ʿAbdallāh Gharīb.
high summit
Dj. Shudbe (1700)
Dj. Loḥāq
Dj. Sirbān
W. ʿAbdallāh Gharīb
Ghadīb
Dj. Dabīs
Dj. Shudbe
Dj. Ghaiba
Dj. ʿAran
(530)

End map III E

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

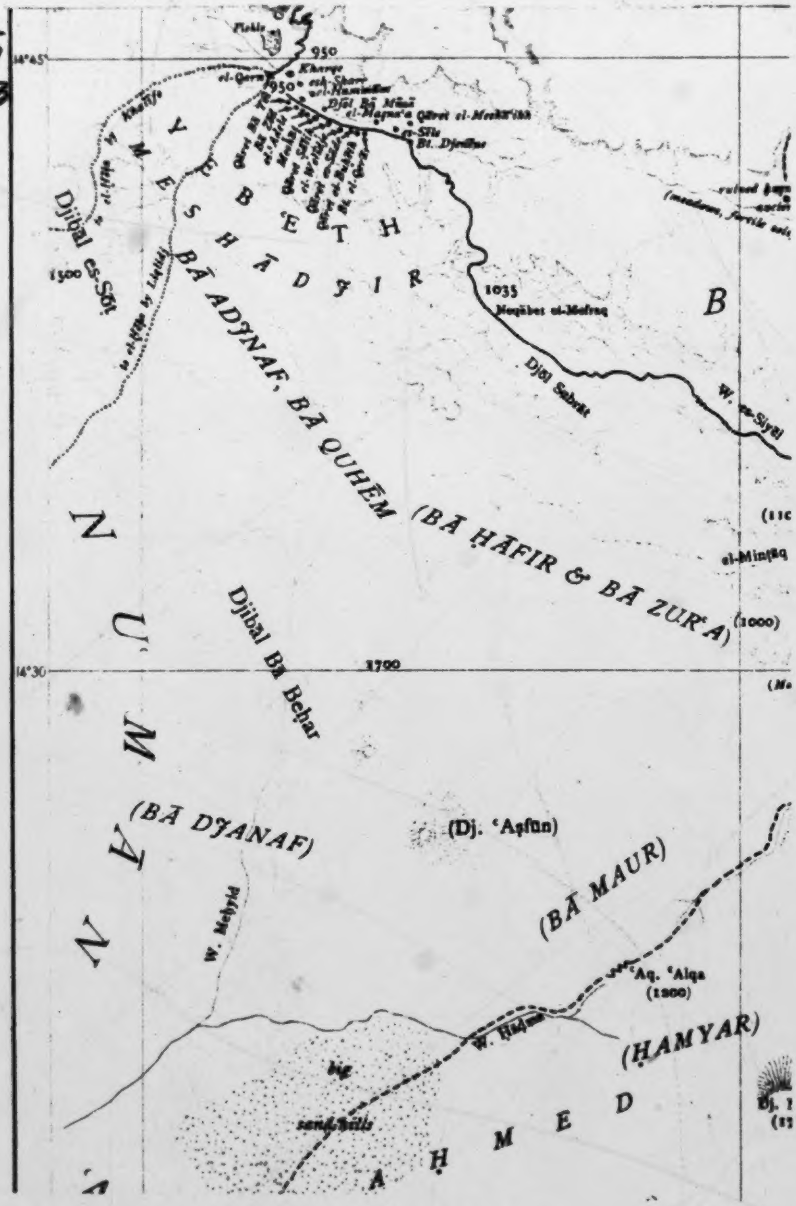
249 (18)

102
487
● 133


15°15'
el-Nobe
Ma'yān el-Mesādjid
Duba
Rīdet Zaghfal
Rīdet Zaghfal
esh-Shiḥr
W. Ma'ādjene
R A
W. 'Arf
1300
Maqadd el-Fiqra
(Qabr Shēkha)
15°
Djebel el-Fiqra
She'amile
Dj. Shōt
110
Ghīl Bā Wazīr

End map III F

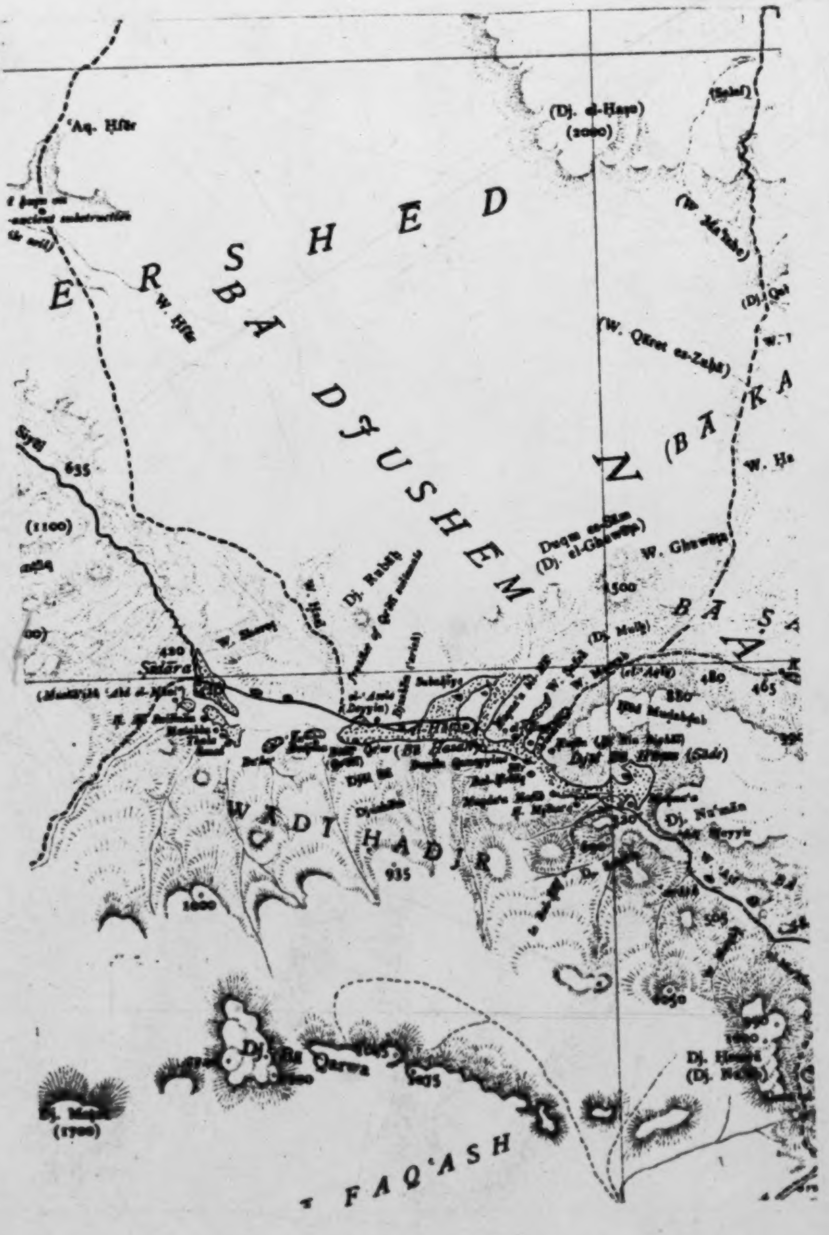
102
489
133


14°45'
14°30'
950
el-Qorn
950
Kharqe
Djōl Bā Mūsā
el-Maqna'a
Qārat el-Meshārīḥ
es-Sīle
Bī. Djedhur
1035
Naqābet el-Mafraq
Djōl Sabrāt
W. es-Siyāl
el-Minṭāq
(1000)
B
Djibāl es-Sōt
1500
YESHBETH
MESHĀDYIR
BĀ ADYNAF, BĀ QUHĒM (BĀ ḤĀFIR & BĀ ZURʿA)
NUʿMĀN
Djibāl Bā Beḥar
1700
(BĀ DJANAF)
(Dj. ʿAṣfūn)
(BĀ MAUR)
W. Mebyid
ʿAq. ʿAlqa
(1200)
W. Ḥadjar
(ḤAMYAR)
big sand-hills
AḤMED
Dj.

END MAP IV A

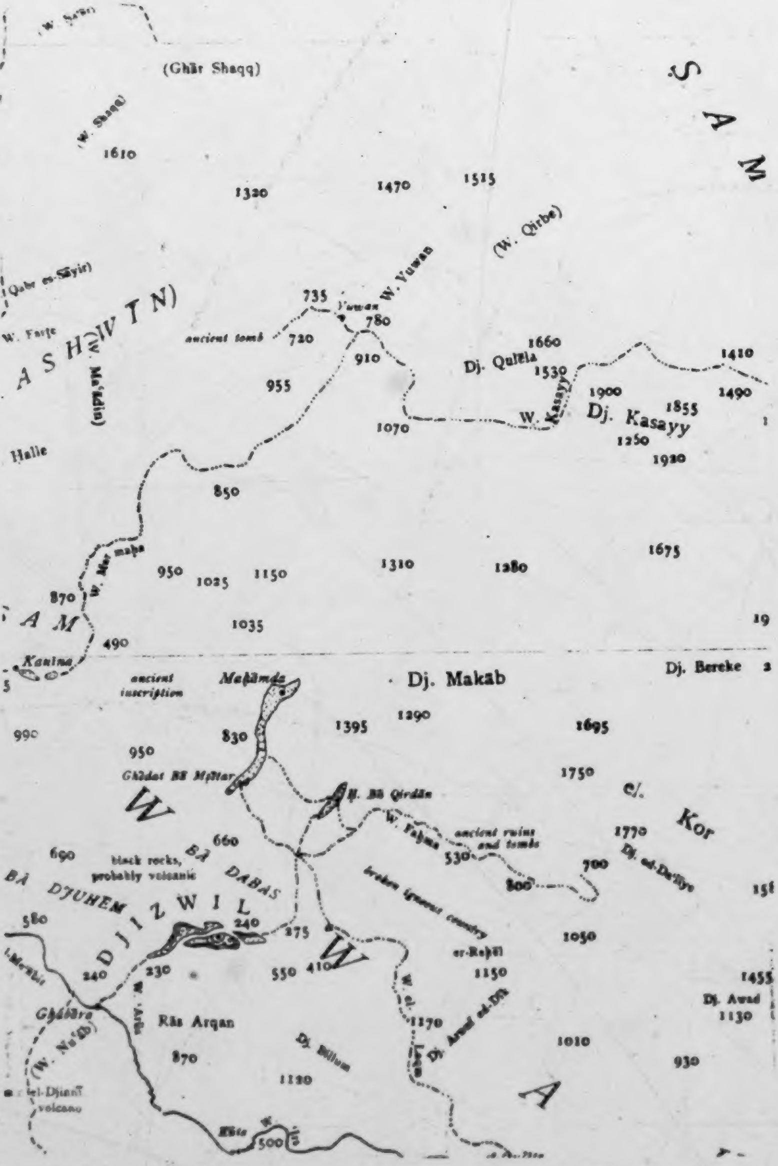
24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

102
487
● 133


'Aq. Hfīr
E R S H E D
W. Hfīr
S B A D J U S H E M
N
(B A K A
(Dj. el-Haya)
(2000)
W. Ghawīṣ
1500
B A S
A
635
(1100)
420
Salāra
480
465
880
W A D I H A D J R
935
1000
Dj. Nu'mān
505
1050
1000
Dj. Hamrā
Dj. Bā Qarwa
(1700)
F A Q 'A S H

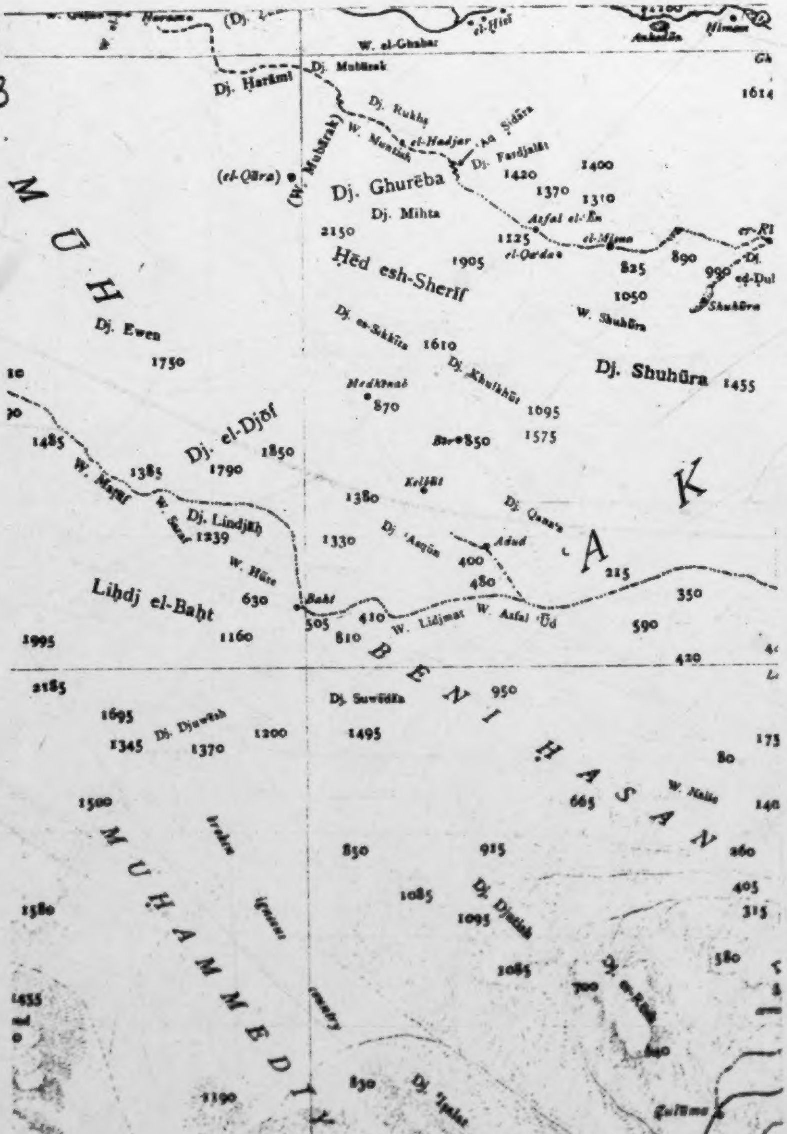
END MAP IV B

102
487
● 133


(W. Sa'ar)
(Ghār Shaqq)
(W. Shaqq)
1610
1320
1470
1515
S A M
(W. Qirbe)
W. Yuwan
(Qabr es-Sāyir)
A S H (W T N)
W. Farfe
(W. Ma'ādin)
735
Yuwan
780
ancient tomb
720
910
955
1660
Dj. Qulēla
1530
1410
1900
1855
1490
W. Kasayy
Dj. Kasayy
1070
1250
1920
Halle
850
W. Mar maḥa
950
1025
1150
1310
1280
1675
870
A M
490
1035
19
Kauina
ancient inscription
Maḥāmde
Dj. Makāb
Dj. Bereke
990
830
1395
1290
1695
950
Ghādat Bā Mḥtar
1750
W
Ḥ. Bā Qirdān
W. Faḥma
ancient ruins and tombs
660
BĀ DABAS
1770
Kor
690
black rocks, probably volcanic
530
700
Dj. ed-Dēlīye
BĀ DJUHEM
800
151
580
D J I Z W I L
240
275
broken igneous country
1050
Merkhi
240
230
550
410
W
er-Reḥīl
1150
1455
Ghābāra
W. Arḥa
Dj. Awad ed-Dīn
Dj. Awad
1130
Rās Arqan
W. el-Leqa
1170
(W. Na'āb)
870
Dj. Billum
1010
930
1120
el-Djinnī volcano
A
Rōta
W.
500

END MAP IV C

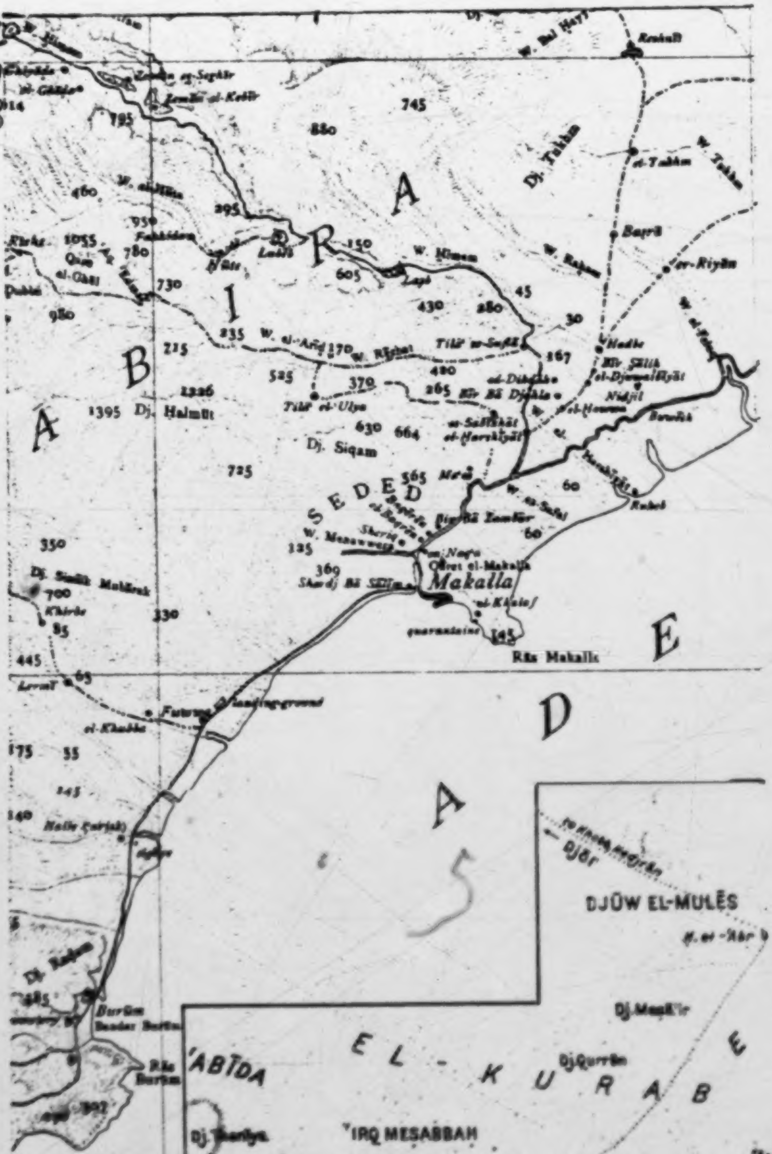
102
487
•133


W. el-Ghabar
Dj. Mubārak
Dj. Ḥarāmi
Dj. Rukhs
W. Muntiṣh
el-Hadjar
Dj. Fardjalāt
(el-Qāra)
(W. Mubārak)
Dj. Ghurēba
Dj. Mihta
Asfal el-ʿĒn
el-Qaʿda
el-Mijne
Dj. Shuhūra
W. Shuhūra
ed-Dul
Ḥēd esh-Sherif
M Ū H
Dj. Ewen
Dj. es-Sikkīta
Dj. Khulkhūt
Dj. Shuhūra
Medkhnab
Dj. el-Djōf
W. Maṭif
Dj. Lindjāh
W. Hūte
Lihdj el-Baht
Baht
Dj. ʿAsqūn
Adud
Dj. Qanaʿa
K
A
W. Lidjmat
W. Asfal ʿŪd
B E N I Ḥ A S A N
Dj. Suwēdā
Dj. Djuwēsh
W. Naʿla
M U Ḥ A M M E D Ī Y Ī N
broken
ground
country
Dj. Djidāh
Dj. Ḥalat
Ṣulīma
el-Ḥini
2150
1905
1420
1400
1370
1310
1125
825
890
990
1050
1610
1750
1455
1614
870
1095
1575
850
1485
1385
1850
1790
1239
1380
1330
400
480
215
350
630
505
410
810
1160
590
1995
420
2185
950
1695
1345
1370
1200
1495
175
80
665
140
1500
850
915
260
405
315
1580
1085
1095
1085
580
700
1455
840
1190
830
895
660
480

End map IV D

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

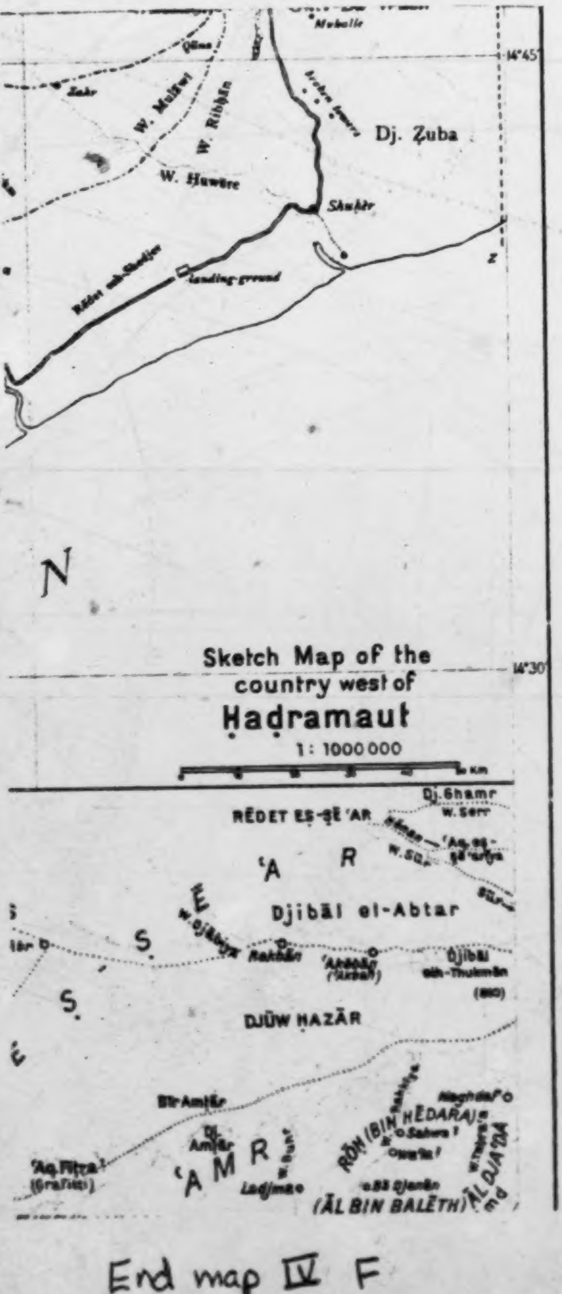
102
487
133


A
R
A
B
I
A
SEDED
Makalla
Rās Makalla
Dj. Halmūt
Dj. Siqam
Dj. Tukhm
W. Himem
er-Riyān
Bujrā
quarantaine
Burūm
Rās Burūm
Dj. Kaḍam
E
D
A
E
F
DJŪW EL-MULĒS
EL-KURABE
'ABĪDA
'IRQ MESABBAH
Dj. Qurrān
Shabwa

5

End map IV E

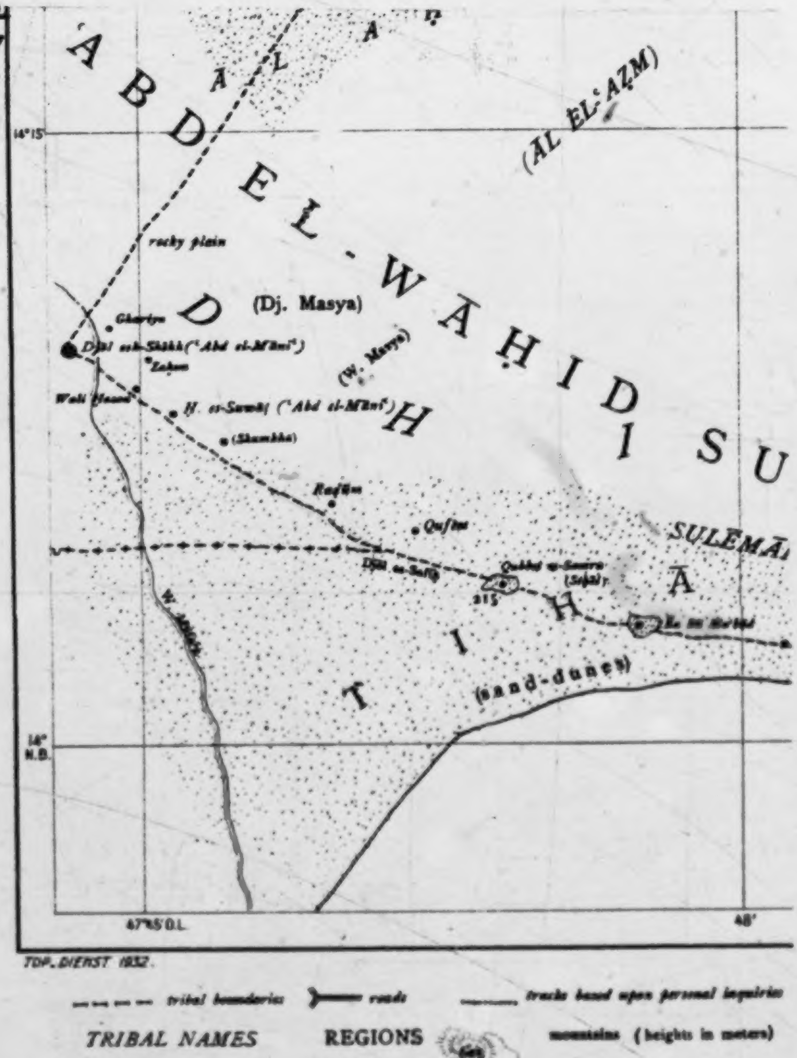
102
487
•133


Mukalla
14°45'
Qâna
Zahr
W. Mulfwi
W. Ribhân
Dj. Ẓuba
W. Ḥuwêre
Shuḳêr
Rêdet esh-Shedjer
landing-ground
Z
N
14°30'
0
10
20
30
40
50 Km
Dj. Ghamr
W. Serr
RÊDET EṢ-ṢÊ'AR
'A
R
Djibâl el-Abtar
W. Djâbîya
Ê
S.
S.
Rakbân
'Akabân ('Akbah)
Djibâl eth-Thukmân
DJÛW ḤAZÂR
Bîr Amḳâr
Dj. Amḳâr
'Aq. Fitra (Graffiti)
'A M R
Ladjma
RÔḤ (BIN ḤEDARA)
Maghdaf
o Sahwa ?
o Bâ Djenân
(ÂL BIN BALÊTH)
ÂL DJA'DA

Sketch Map of the country west of Ḥaḍramaut
1: 1000 000

End map IV F

102
487
●133

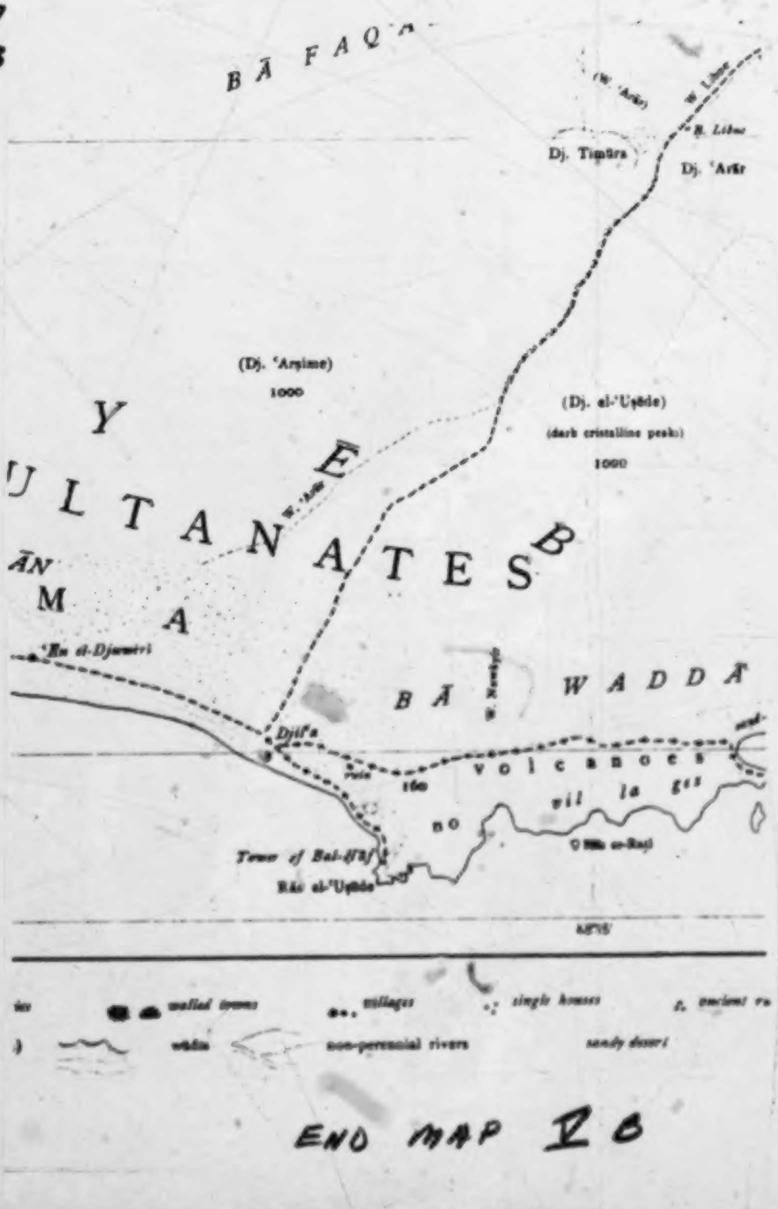

ʿABD EL-WĀHIDI
ʿALAH
(ĀL EL-ʿAZM)
SULEMĀ
ḤIATH
rocky plain
(Dj. Masya)
(W. Masya)
Gharīya
Djōl esh-Shēkh (ʿAbd el-Mūni)
Zahen
Wali Hasan
H. es-Sawdā (ʿAbd el-Mūni)
(Shambha)
Rafūm
Qufim
Djōl es-Safā
Qubbat es-Sawra (Sofā)
215
(sand-dunes)
14°15'
14° N.B.
47°45' O.L.
48°
TOP. DIENST 1932.
tribal boundaries
roads
tracks based upon personal inquiries
TRIBAL NAMES
REGIONS
mountains (heights in meters)

END MAP V A

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

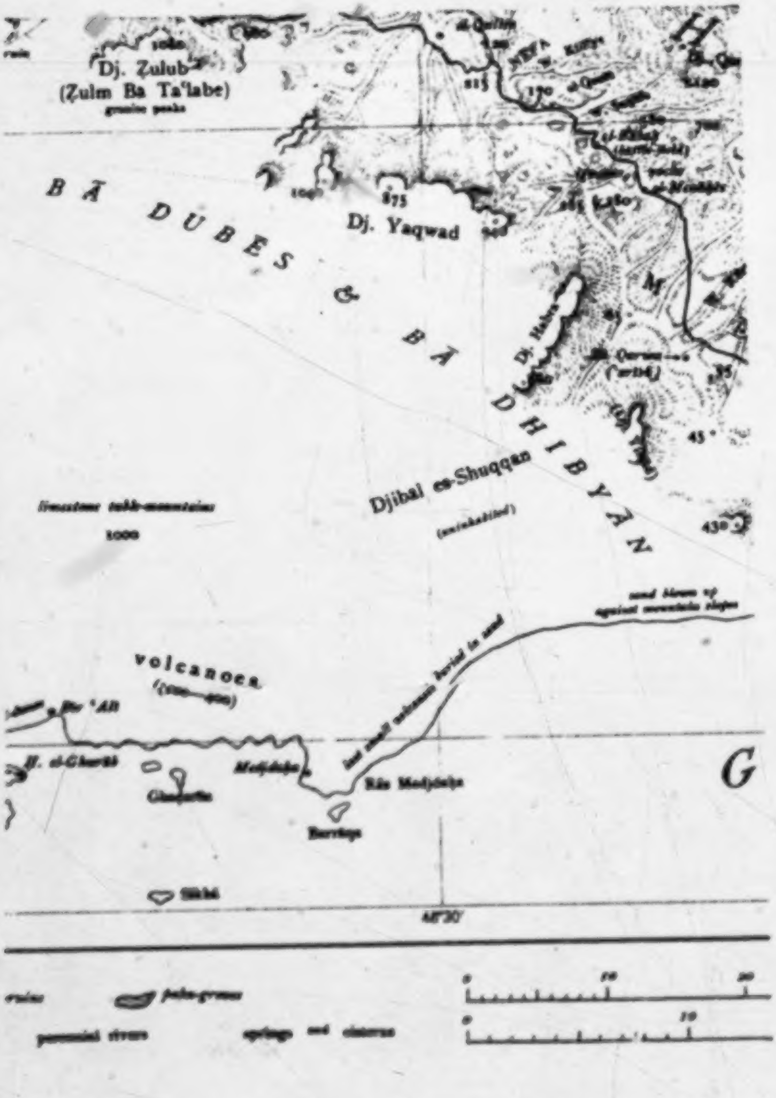
249 (26)

102
487
● 133


BĀ FAQ
(W. 'Arår)
W. Libne
B. Libne
Dj. Timtra
Dj. 'Arår
(Dj. 'Arṣime)
1000
(Dj. al-'Uṣṣde)
(dark cristalline peaks)
1000
Y
E
ULTANATES
B
ĀN
M
A
'Ēn al-Djumēri
BĀ WADDĀ
Djilfa
160
volcanoes
villages
no
Tower of Bal-
Rås al-'Uṣṣde
walled towns
villages
single houses
ancient ru
wadis
non-perennial rivers
sandy desert

END MAP V B

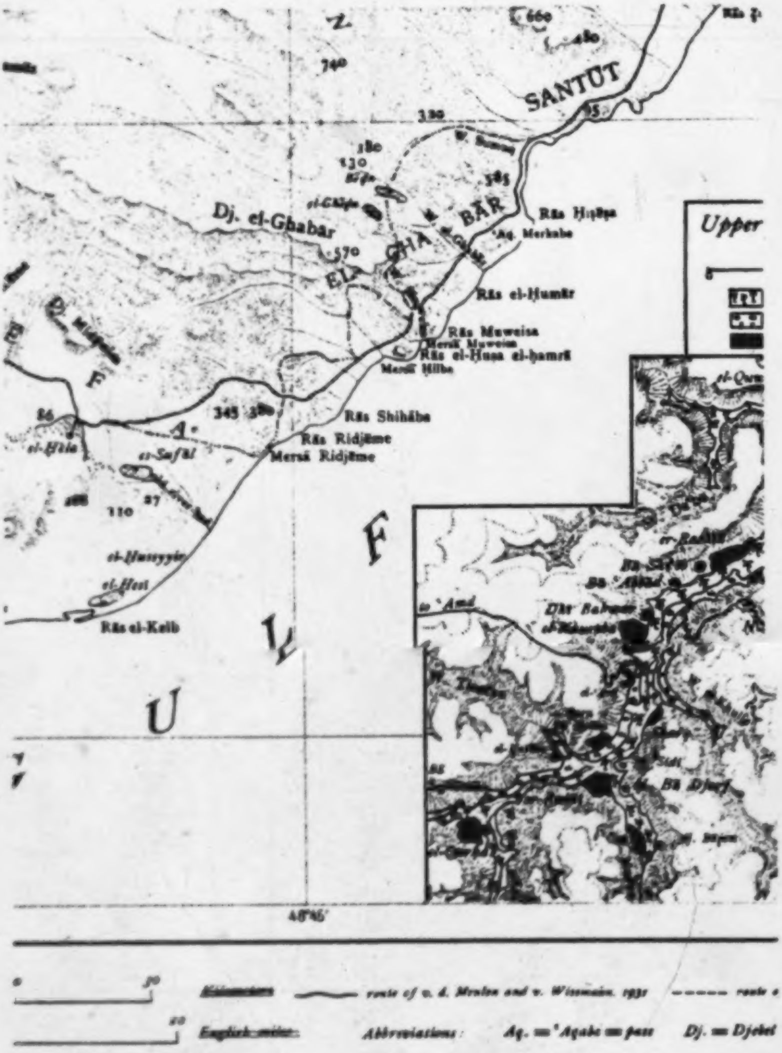
102
487
●133


ruin
1080
Dj. Zulub
(Zulm Ba Ta'labe)
granite peaks
H
BĀ DUBES & BĀ DHIBYĀN
875
Dj. Yaqwad
940
Dj. Habra
M
45°
Djibal es-Shuqqan
(uninhabited)
limestone table-mountains
1000
43°
sand blown up against mountain slopes
volcanoes
Bir 'Ali
H. el-Ghorab
Medjdeha
Ras Medjdeha
G
Barraqa
Sikha
48°30'
ruins
palm-groves
perennial rivers
springs and cisterns
0
10
20
0
10

END MAP VC

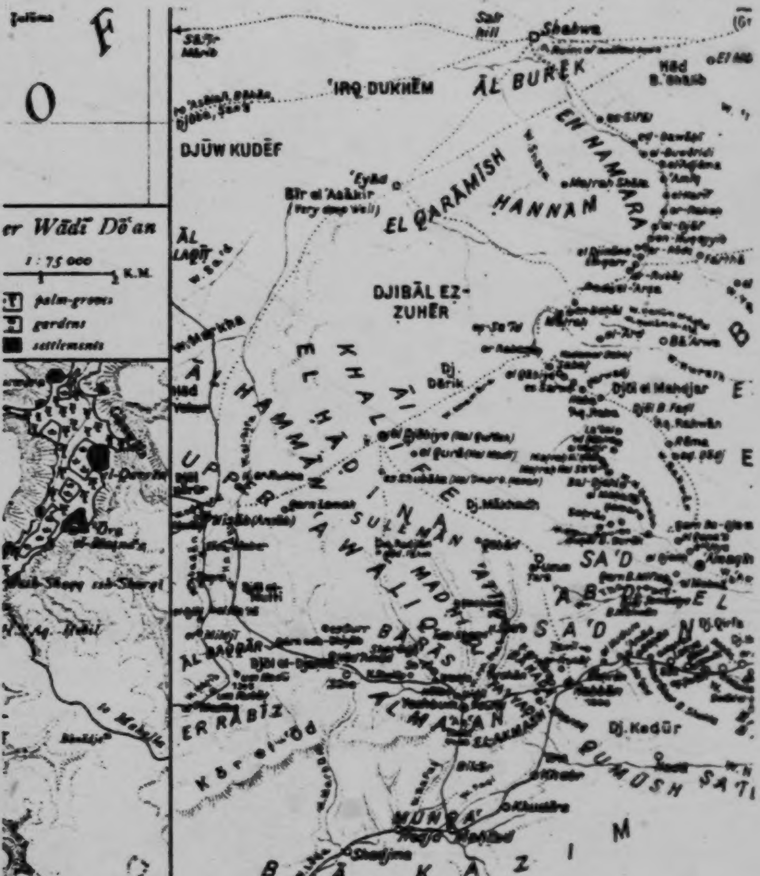
24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

102
487
●183


SANTUT
Dj. el-Ghabar
EL GHA BAR
Râs Ḥiṣḥṣa
Aq. Merkabe
Râs el-Ḥumâr
Râs Muweisa
Mersâ Muweisa
Râs el-Ḥusn el-ḥamrâ
Mersâ Ḥilbe
Râs Shihâbe
Râs Ridjâme
Mersâ Ridjâme
el-Ḥûla
es-Safâl
el-Ḥuseyyin
el-Ḥost
Râs el-Keib
F
U
Upper
48°45'
Kilometers
English miles
route of v. d. Meulen and v. Wissmann, 1931
Abbreviations:
Aq. = 'Aqabe = pass
Dj. = Djebel

End map V D

102
487
● 133


F
O
er Wādī Dōʿan
1 : 75 000
K.M.
palm-groves
gardens
settlements
Shabwa
ĀL BURĒK
ʿIRQ DUKHĒM
DJŪW KUDĒF
Bīr el ʿAshārir
(very deep well)
EL QARĀMISH
HANNAN
EN NAMARA
ĀL LAQĪT
DJIBĀL EZ-ZUHĒR
Dj. Dārik
KHALĪFE
EL HĀDĪ
ĀL HAMMĀM
UPPER ʿAWĀLIQ
SULṬĀN
NĀṢIR
MADHI
ʿATTĀB
SAʿD
ʿABDEL
ĀL BARĀS
ĀL MAʿAN
ĀL BADDĀR
ER RABIZ
Kōr el-ʿŌd
Dj. Kedūr
DUMŪSH
MUNQAʿ
B Ā KAZIM
B E E
49°
48°

---

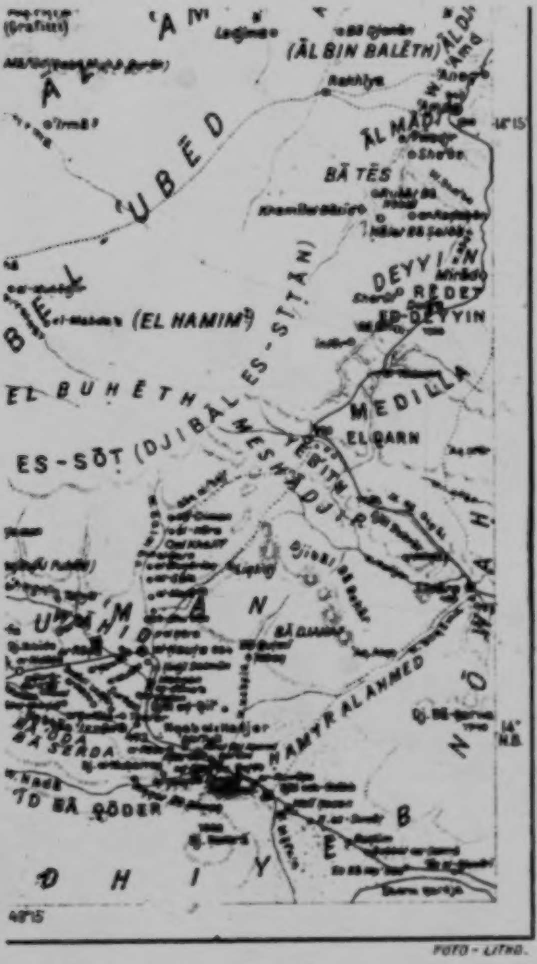
te of A. v. Wrede 1843 ——— routes of L. Hirsch and Imām Sherif Khan Bahadur (surveyor of Th. Bent) 1893

bel = mountain   Ḥ = Ḥuṣn = castle, fortified house   W. = Wādī = riverbed   Bt = Bīt = house.

End map V E

249 (30)

102
487
•133


(Graffiti)
'A
(ĀL BIN BALĒTH)
Rethīya
A
UBĒD
ĀL MĀDI
BĀ TĒS
DEYYIN
REDET
ED-DEYYIN
(EL HAMIM)
B
E
EL BUHETH
(DJIBĀL ES-SIṬĀN)
MEDILLA
EL QARN
ES-SŌṬ
WESHĀDJIR
YEBĪTH
Djibāl Bā Sadāl
M
Ā
N
HAMYR AL AHMED
14° N.B.
14°15
BĀ SĀDA
ĀL BĀ QŌDER
B
E
D
H
I
Y
48°15
FOTO - LITHO.

3 ——— route of O. H. Little 1927 —▲—◆ routes of other explorers

ause, family B = Bin = son

End map V F

249 (31)

102
487
133

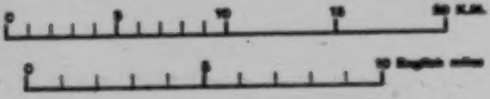
ḤAḌRAMAUT

Scale 1 : 250 000

by Dr. H. von Wissmann.

(Map belonging to "Ḥaḍramaut, some of its mysteries unveiled" by D. van der Meulen and H. von Wissmann.)

NOTE. The scale given under the map is wrong and the following should be used instead.



End map VI

Middle East Islands MZ1
Socotra

H

Where the slopes permit, the sides of the hill are 241
terraced by the industrious inhabitants to grow crops and, in the higher 245
altitudes, the excellent Mocha coffee for which Southern Arabia is H
famous. Villages appear in unexpected places, built of mud brick in 361
the low country and of stone on the mountain-sides and hill-tops. 349
Among these habitations are seen always the square towers, or *dars*, and the little mosques or whitewashed shrines that are characteristic of the Arab villages. H

The aspect of the country varies in its different parts. Immediately 361
to the north of Aden is the large and fertile oasis in which stands the 312
capital of the Sultan of Lahej. It is irrigated from the bifurcation of 133
the Wadi Tiban that brings water from the mountains and then disappears in the sands near Aden. To the east and west of Lahej are desert strips, but beyond are the Subeihi hills and valleys to the north-west, the rugged Haushabi country, and the pleasant district of Dhala in the Amiri highlands to the north, and the lofty mountains of Yafa to the north-east. Thence to the eastward a steep escarpment spans the country like a rampart, and is crowned by the fertile Audhali plateau 7,000 feet above sea-level. Farther east, beyond another stretch of rough, mountainous country, is the fantastic and barren *jol*, reminiscent of pictures of the surface of the moon. To the north of this strange and desolate area, and in striking contrast to it, is the wide valley of the Hadhramaut, with its chain of towns and villages, its skyscrapers, country houses, palace and gardens. Beyond again, away to the north, lies the edge of the Rub' al Khali, the Empty Quarter, with its sea of tumbled terra-cotta coloured sand dunes stretching into the distant interior.

On the sea coast of the Protectorate there are at intervals fishing villages and little ports, and about 300 miles to the east of Aden stands the picturesque town and port of Mukalla, the capital of the Quaiti Sultan. Protected by a steep background of rock, its white houses cling to the shore, and its appearance from the sea is singularly attractive. The town of Shehr lies on the coast beyond it, and eastward again there are more coastal villages, of which Qishn, the capital of the mainland territory of the Sultan of Socotra, is the most important. H

The large island of Socotra, situated about 500 miles to the east of 131
Aden, forms part of the Protectorate. It, too, is a mountainous
country, but, owing to its greater rainfall, it is much less bleak than the S
neighbouring mainland. It has a good deal of varied vegetation, and is [illegible]
noted for its so-called dragon's-blood tree, the sap of which is exported 137
to India and elsewhere to make a rich purple dye. Socotra has also a 000

3:Royal Institute of International Affairs U-4 (no date)1954 M1 Middle East

Aden MM1
Hadramaut MM2

Continuing friction was sharpened when British geologists 175
prospected unsuccessfully for oil in part of the disputed territory. In 1949 the RAF bombed a fort which Yemeni troops were building on territory claimed by the Sharif of Baihan, a ruler within the Western Aden Protectorate. A new Anglo-Yemeni Treaty of 1951[1] proposed to settle the frontier dispute by means of a joint commission. In April 1952, however, the Sultan Fadl Abdul Karim of Lahej (the most important state of the Western Aden Protectorate) summarily executed two of his cousins and, when 'invited' by the Governor of Aden to go there for medical treatment pending an independent judicial inquiry, fled to the Yemen. The Yemen Government immediately protested against the temporary occupation by Aden Protectorate Levies of Lahej town (which lies thirty miles from the Yemen frontier), on the grounds that the Yemen 'had vital interests in the stability of that area'.[2] A council of the tribal leaders of Lahej unanimously declared Fadl Abdul-Karim deposed in favour of his younger brother, the Aden Protectorate Government having imposed as a condition of his election that he should accept a resident adviser as a precaution against the irregularities which had occurred under Fadl Abdul-Karim.[3] The latter meanwhile continued to protest to the Arab League against his deposition, claiming that Lahej had always enjoyed autonomy and connecting the Aden Government's action with AIOC's proposal to build its refinery.[4]

Kamaran Island, lying off the Yemen coast 200 miles north of Perim, was an Ottoman quarantine station for pilgrims travelling to Mecca from the East. British forces occupied it in 1915; and when the Turkish Republic renounced its sovereignty over the island in the Treaty of Lausanne (1923), its status became indeterminate; but it continued to be administered by the Governor of Aden and to be available for use as a quarantine station.

THE PROTECTORATE

The area of the Western Protectorate is approximately 42,000 H 131
square miles and of the Eastern Protectorate 70,000, Aden
Colony being a small enclave (75 square miles) in the territory H
of the latter. Arable land is estimated at only one-third per cent 133
of the whole, and established pastures and meadows are un- 132
known, the bulk of the area being desert or steppe, which pro-

---

[1] Cmd. 8590 (1952).

[2] *The Times*, 23 April 1952.

[3] *Mideast Mirror*, 11 October 1952, p. 25.

[4] *Bourse Égyptienne*, 10 and 25 June 1952; cf. *The Times*, 27 October 1951, 4 April 1952.

3:Royal Institute of International Affairs U-4 (no date)1954 M1 Middle East

Hadramout MM2

133 vides seasonal grazing for camels, sheep, and goats.[1] Never-
132 theless, the Western Protectorate, where rainfall averages from
about 2 inches a year on the coast to 7 inches in the uplands
and 12 inches in the highlands, is self-supporting in food in
241 normal seasons; the main crop is millet, with wheat, barley,
and mustard as summer crops, and other products of importance
are coffee and the drug *qat* (the chewing of which is a pernicious
habit in south-west Arabia); field-terracing is general in the
[312] highlands, and elsewhere the land is mainly irrigated from
wells. In the Eastern Protectorate the rainfall is lower and food
132 has to be imported, particularly for the coastal areas and the
241 pastoral tribes; millet is again the main cereal crop, supple-
439 mented by lucerne, tobacco, honey, and fish products; until
recently most of the honey has been exported to Java, this
167 being connected with the large-scale eastward emigration from
262 the Hadramaut in the last 150 years. The date-palm provides
the chief food product of the Hadramaut.

161 The estimated population of Aden Protectorate at mid-1952
was 800,000. The organization is largely tribal, consisting of
631 some thirty sultanates, shaikhdoms, and other tribal units of
648 varying size. During the past hundred years their rulers have
643 one by one entered into treaty relations with the British Government and are under its protection; but British administration (through an Agent in each Protectorate, responsible to the Governor of Aden) is essentially indirect, and has grown piecemeal for the prevention of intertribal conflict in the interests of travellers and commerce. Some of the chiefs have voluntarily accepted advisory treaties binding them to administer their territories in accordance with the Governor's advice. But not all of them have complete control over their nominal subjects, and the authority of those who have not accepted advisory treaties with the Governor of Aden may be highly capricious; reference has already been made to the conduct of the important Sultan of Lahej which led to a British intervention in April 1952.[2] The most important state of the Eastern Protectorate is the Quaiti Sultanate of Shihr and Mukalla which, like the Sultanate of Lahej, carries the title of 'His Highness' and has its own small regular army; the Quaiti

---

[1] See 'Banishing Famine from Aden', *Commonwealth Survey*, 14 May 1949, pp. 37–8. For the distinction between steppe and desert vegetation, see Fisher, *The Middle East*, pp. 72–3 and map, p. 70.

[2] See above, p. 103; and see generally Doreen Ingrams, *A Survey of Social and Economic Conditions in the Aden Protectorate* (Eritrea, Government Printer to the British Administration, 1949), pp. 20–32. A punitive expedition was sent to the Shairi tribe in the Western Protectorate in December 1950 after an attempt to assassinate the British Agent.

29:Dunn S-4 (1952)1952 Ml Middle East .
Hadhramaut MM2

CHAPTER VIII

COTTON IN ARABIA

Arabia is divided into numerous groups, most of which are actually principalities. The boundaries of the subdivisions are indefinite and so is the authority of the local rulers in most cases. Some of these groups like to call themselves independent countries. One is called a kingdom. Some are called protectorates. The British have exercised the major influence over all these groups for 50 years and still do but in varying ways. One small spot of land actually belongs to the British Crown. 000

ADEN PROTECTORATE

The narrow strip of land along the southwestern tip of the Arabian Peninsula includes a number of territories and dependencies of Arab chiefs which have been organized under a protectorate treaty with the British, and is called the Protectorate of Aden. 101

The Protectorate is about the size of Arizona. It has about 660,000 people, many of whom are nomads. The country is mostly mountainous though there are a few valleys and flood plains capable of cultivation. The Food and Agriculture Organization estimates that there are about 270,000 acres actually in cultivation at the present time. As the plains receive only about four inches of rainfall annually, irrigation is required. Considerable water is available as rainfall in the mountains is rather heavy, approaching 40 inches annually, but facilities are inadequate for catching and directing the water. 133 311 [161]

The economy of the protectorate rests almost solely on agriculture. The principal crops are grains and some fruits, principally dates. While a small quantity of coarse grains is normally exported, the country usually imports about half its bread grain requirements. 241

COTTON

Cotton has been grown in this area in small quantities for hundreds of years, but never in commercial quantities until very recent years when British interests began promoting production. 248

The following article on the present status and prospects of cotton production in the Protectorate was written especially for this report by the research staff of the Empire Cotton Growing Corporation, London, with the collaboration of Major Congdon, Manager of the Abyan Board in the Aden Protectorate. 114

RECENT HISTORY

"During the last war to increase the production of food, the old Abyan irrigation system was reopened and the headworks were partially restored under the direction of the Department of Agriculture. The reclaimed areas were used mainly for sorghum, bulrush millet and simsim, but it soon became 241 248

5:Gt. Brit., Colonial Office G-3 (1947) 1949 MM1 Aden
Hadhramaut MM21

509 no regular steamer service, but the R.A.F. continued the carrying of mail and Government passengers, while in May Ethiopian Air Lines, an American company, received permission to run a fortnightly service, Aden-Riyan and return, which they continued to do throughout the year.

Chapter 11: Geography and Climate

SITUATION AND AREA

131 The Aden Protectorate which can be more conveniently described administratively and geographically by dividing it into two areas, the Western and Eastern, has a total superficial area of about 112,000 square miles. It is bounded on the east by the western boundary of the Sultanate of Muscat and Oman, on the north and west by the Ruba' al Khali (or Empty Quarter) and the kingdom of the Yemen (whose southern boundary was temporarily stabilised by Article III of the Treaty of Sana'a of 11th February, 1934, by which His Majesty's Government and the Government of the Yemen agreed to maintain the *status quo* as on the date of the signature of the treaty), and on the south by the Gulf of Aden and the Indian Ocean. The Aden Protectorate seaboard starts at Husn Murad (opposite Perim) on the west, and runs for 740 miles eastwards to Ras Dhurbat Ali, where it meets the frontier of the Sultanate of Muscat and Oman.

CLIMATE

132 The maritime plains are damp and hot in the summer, and are subject to sandstorms and high winds. In the winter (October to the end of
133 March) it is cool and sometimes cold at night and much less damp.

In the mountains, which vary in height between 1,500 and 8,000 feet, it is drier and cooler during the day and night; at above 4,500 feet it can be very cold.

In the Wadi Hadhramaut and the intervening tableland or "Jol", extremes of both heat and cold are encountered. The heat, in contrast to that of the coast, is dry, but more intense. The rainfall is small.

There is little rainfall in the littoral and maritime hills; here cultiva-
[241] tion is chiefly dependent on irrigation from water channels and courses. In the highlands well irrigation is common and there is heavier rainfall, which is led down ravines and defiles into terraced fields.

GENERAL DESCRIPTION

133 The Western Aden Protectorate is divided into: the littoral belt which varies between four and 40 miles in depth; the maritime ranges about 1,000–2,000 feet above sea-level; the intramontane plains over 3,000 feet high; and the highland plateau which ranges from 5,000 to

5:Gt. Brit. Colonial Office G-3 (1947) 1949 MM1 Aden
Hadhramaut MM21

8,000 feet high and falls away into the Ruba' al Khali (or Empty Quarter), 133
with a mean altitude of 2,500 feet. The country between the littoral belt on the one hand and the intramontane plains and the plateau on the other is a tangle of mountains, ravines and valleys. Some of the valleys are very fertile. The plateau itself is broken up by numerous hills and mountains and is intersected with several deep valleys.

The greater part of the Eastern Aden Protectorate consists of desert and barren mountains intersected by wadis, some of which are fertile and
cultivated. There are a number of comparatively large towns, notably 361
Mukalla, the capital of the Qu'aiti State and principal seaport, and Seiyun, the capital of the Kathiri State.

Chapter 12: Administration

The Eastern Aden Protectorate comprises the Hadhramaut (consisting 631
of the Qu'aiti State of Shihr and Mukalla, and the Kathiri State of
Seiyun), the Mahri Sultanate of Qishn and Socotra, the Wahidi Sultanates
of Bir 'Ali and the Sheikhdoms of Irqa and Haura, all of which have been 648
for many years in protective treaty relations with His Majesty's Government.
His Highness Sultan Sir Salih bin Ghalib al Qu'aiti, K.C.M.G., 643
Sultan of Shihr and Mukalla, is the premier chief in the Eastern Aden Protectorate, and the Hadhramaut is the most important and best organised of these areas. It is bounded on the west by the Wahidi Sultanates and on the east by the Mahri Sultanate.

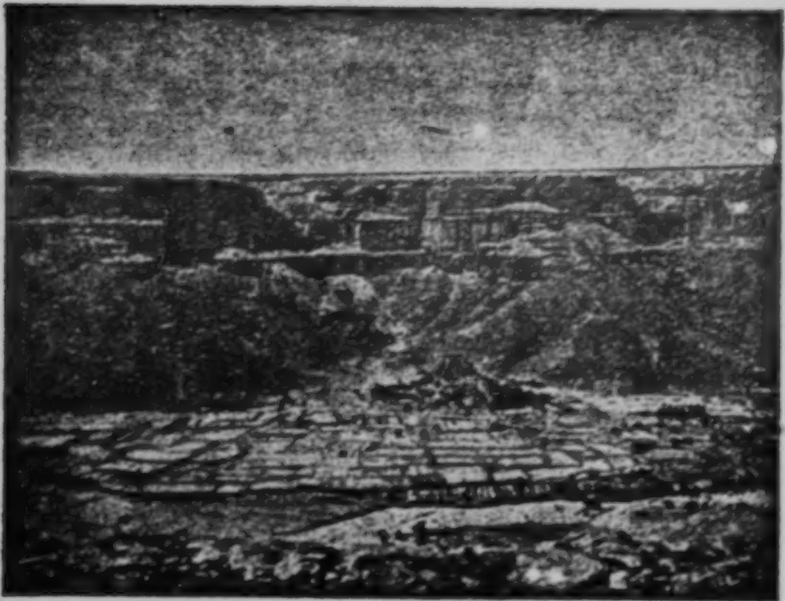
The Mahri Sultanate of Qishn and Socotra is the most easterly area in the Aden Protectorate, being bounded on the east by the Sultanate of Muscat and Oman. The Sultan of Qishn and Socotra resides on the island of Socotra, which lies off Africa, 150 miles from Cape Guardafui.
The island was occupied by the East India Company in 1834, and it 175
came under British protection, together with the neighbouring Abdel Kuri and Brothers Islands, in 1866, when the treaty with the Mahri
Sultan was concluded. Socotra produces aloes, dragons' blood and ghee. 438
The population is probably about 5,000; the island is rather less than 166
100 miles from east to west and about 30 miles broad. Its interior is 133
mountainous, and the Fidahan Hajr rises to nearly 5,000 feet. The capital 361
is Hadibu, shown on European maps as Tamarida.

The interests of the Western Aden Protectorate are looked after by a 643
small cadre of British political officers and Arab assistant political officers under a British Agent, whose headquarters are in Aden. The political staff who are posted to administrative districts inland advise the local rulers on the administration of their areas, since His Majesty's Government does not administer the Protectorate directly.

The tribes nominate their own chiefs, who have subsequently to be 619
recognised by the Governor of Aden. Not all the chiefs have complete 622
control over their subjects, but since 1943 the authority of some of them

8:Gt. Brit., Colonial Office G-3 (1948) 1950 MMI Aden
Hadhramaut MM2

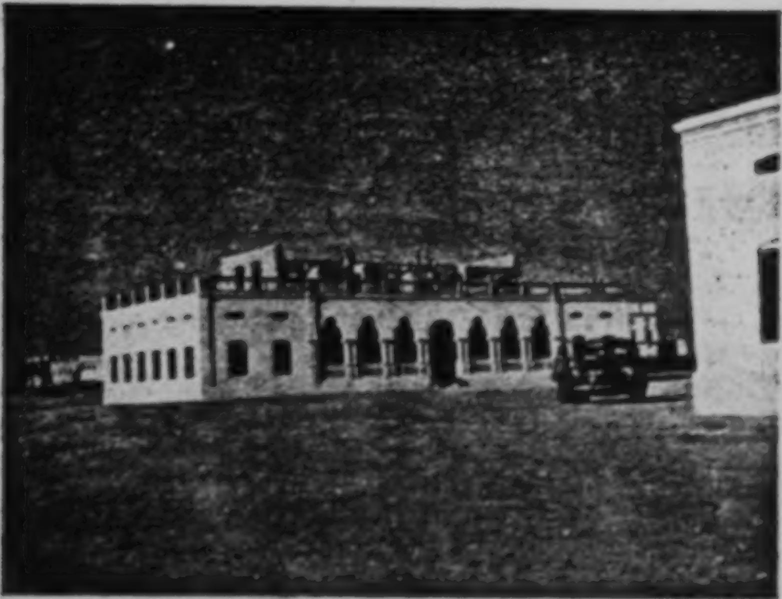
133



With acknowledgments to A. R. Thomas

WADI AMD, HADHRAMAUT

346



With acknowledgments to A. R. Thomas

NEW TEACHER TRAINING SCHOOL, GHEIL BA WAZIR,
ADEN PROTECTORATE

Facing p. 40 (B)

Hadhramaut MM2

131 tanate of Muscat and Oman, on the north and west by the Ruba' al Khail (or Empty Quarter) and the kingdom of the Yemen (whose southern boundary was temporarily established by Article III of the Treaty of Sana'a of 11th February, 1934, by which His Majesty's Government and the Government of the Yemen agreed to maintain the status quo as on the date of the signature of the treaty), and on the south by the Gulf of Aden and the Indian Ocean. The Aden Protectorate seaboard starts at Husn Murad (opposite Perim) on the west, and runs for 740 miles eastwards to Ras Dhurbat Ali, where it meets the frontier of the Sultanate of Muscat and Oman.

CLIMATE

132 The maritime plains are damp and hot in the summer, and are subject to sandstorms and high winds. In the winter (October to the end of March) it is cool and sometimes cold at night and much less damp.

In the mountains, which vary in height between 1,500 and 8,000 feet, it is drier and cooler during the day and night; at above 4,500 feet it can be very cold.

In the Wadi Hadhramaut and the intervening tableland or "Jol", extremes of both heat and cold are encountered. The heat, in contrast to that of the coast, is dry, but more intense. The rainfall is small.

There is little rainfall in the littoral and maritime hills; here cultivation is chiefly dependent on irrigation from water channels and courses. In the highlands well irrigation is common and there is heavier rainfall, which is led down ravines and defiles into terraced fields.

GENERAL DESCRIPTION

133 The Western Aden Protectorate is divided into the littoral belt which varies between four and 40 miles in depth; the maritime ranges about 1,000–2,000 feet above sea-level; the intramontane plains over 3,000 feet high; and the highland plateau which ranges from 5,000 to 8,000 feet high and falls away into the Ruba' al Khali (or Empty Quarter), with a mean altitude of 2,500 feet. The country between the littoral belt on the one hand and the intramontane plains and the plateau on the other is a tangle of mountains, ravines and valleys. Some of the valleys are very fertile. The plateau itself is broken up by numerous hills and mountains and is intersected with several deep valleys.

The greater part of the Eastern Aden Protectorate consists of desert and barren mountains intersected by wadis, some of which are fertile and
3!! cultivated. There are a number of comparatively large towns, notably Mukalla, the capital of the Qu'aiti State and principal seaport, and Seiyun, the capital of the Kathiri State.

Chapter 12: Administration

131 The Eastern Aden Protectorate comprises the Hadhramaut (consisting
648 of the Qu'aiti State of Shihr and Mukalla, and the Kathiri State of Seiyun),

6:Gt. Brit., Colonial Office G-3 (1948) 1950 MM1 Aden

Hadhramaut MM2

the Mahri Sultanate of Qishn and Socotra, the Wahidi Sultanates of 631
Bir'Ali and the Sheikhdoms of Irqa and Haura, all of which have been 648
for many years in protective treaty relations with His Majesty's Government.
His Highness Sultan Sir Salih bin Ghalib al Qu'aiti, K.C.M.G., 643
Sultan of Shihr and Mukalla, is the premier chief in the Eastern Aden
Protectorate, and the Hadhramaut is the most important and best
organised of these areas. It is bounded on the west by the Wahidi Sultanates
and on the east by the Mahri Sultanate.

The Mahri Sultanate of Qishn and Socotra is the most easterly area in 631
the Aden Protectorate, being bounded on the east by the Sultanate of 622
Muscat and Oman. The Sultan of Qishn and Socotra resides on the
island of Socotra, which lies off Africa, 150 miles from Cape Guardafui. 175
The island was occupied by the East India Company in 1834, and it came 438
under British protection, together with the neighbouring Abdel Kuri 161
and Brothers Islands, in 1866, when the treaty with the Mahri Sultan was
concluded. Socotra produces aloes, dragons' blood and ghee. The 133
population is probably about 5,000; the island is rather less than 100 miles 361
from east to west and about 30 miles broad. Its interior is mountainous,
and the Fidahan Hajr rises to nearly 5,000 feet. The capital is Hadibu,
shown on European maps as Tamarida.

The interests of the Western Aden Protectorate are looked after by a 645
small cadre of British political officers and Arab assistant political officers
under a British Agent, whose headquarters are in Aden. The political
staff who are posted to administrative districts inland advise the local
rulers on the administration of their areas, since His Majesty's Government
does not administer the Protectorate directly.

The tribes nominate their own chiefs, who have subsequently to be 619
recognised by the Governor of Aden. Not all the chiefs have complete 701
control over their subjects, but since 1943 the authority of some of them
has been greatly increased by the introduction of simple administrative 625
machinery. For internal security some of the chiefs have Tribal Guards 624
(paid for by His Majesty's Government as a temporary measure) under
the joint control of the British Agent and the chief. In 1937 the
Aden Government raised a force known as the Government Guards
for police duties in the Western Aden Protectorate; they are stationed
inland in fixed posts and are paid for and controlled entirely by Government.

The Western Aden Protectorate consists of the following tribal 631
districts: 361

ABDALI: His Highness Sultan Fadhl bin Abdul Karim Fadhl, [643]
Sultan of Lahej, the premier Chief of the western area. *Capital*: Lahej.

AMIRI: Amir Nasr bin Shaif, C.M.G. *Capital*: Dhala.

FADHLI: Sultan Abdullah bin Uthman. *Capital*: Shuqra.

LOWER YAFA'I: Sultan 'Aidrus bin Muhsin. *Capital*: Al Qara.

HAUSHABI: Sultan Mohammad bin Sarur. *Capital*: Museimir.

7: Gt. Brit., Colonial Office G-3 (1949-50) 1951 MM1 Aden
Hadhramaut mm2

accounts section the position was particularly serious; but equally 654
important was the lack of essential hydrological data on such matters
as river discharges, the availability of suitable storage sites, studies
on percolation and so on. Without such information progress must
be delayed.

As mentioned earlier, the X1730A type of cotton planted on 248
82 acres in 1948, proved a great success. The crop was ginned and 242
marketed by the Board, and arrangements with cultivators for the
new season's planting resulted in an extension of the acreage to 1,097 654
acres. At the end of 1949 the crop showed great promise, and in many
areas appeared even better than the previous year's crop.

Grain, oil-seed and fodder production was satisfactory, though grain yields were reduced in many areas through double-cropping the land with a sorghum fodder crop in the Saif season and then a grain crop in the Kharif.

A great deal of the land in Abyan which has been well irrigated 654
for the past five years is now becoming heavily infested with weeds, 137
mainly the weed grass *Desmostachya bipinnata*. The introduction of
cotton as a cleaning crop and the "drying up" and resting with or 242
without cultivation, of these heavily infested lands is now recognised as
an urgent matter. In order to tackle the weed problem the Board
increased its tractor strength by the purchase of three Fowler Diesel
crawler tractors in the last quarter of 1949.

Another problem which came to notice towards the end of 1949 133
was the rapid rise in the height of the water table in certain areas. The 242
area involved does not exceed 300 acres, but already in this area (where
in places the water table has risen to within six feet of the surface)
salts are appearing in the upper layers of the soil, and vegetation,
particularly in the seedling stage, has been affected. It was noticed
that cotton, once established, flourished and appeared exceedingly
healthy on these salt-impregnated soils.

Anti-Famine Measures

In the first four-and-a-half months of 1949 until general rains fell 731
over the Eastern Protectorate, famine again threatened human life in
the Hadhramaut. Relief measures were introduced, as in the previous
famine, but this time so promptly that practically no deaths from
famine occurred. Again aircraft of the Royal Air Force came to the
rescue and dropped grain supplies to the worst affected areas. Large
quantities of grain were moved inland by motor transport and any
camel transport that could be mustered; at the same time large numbers
of the destitute, particularly women and children, were brought down
or walked down to the coastal towns, where they were accommodated
in refugee camps and fed. To employ labour on relief works an extensive [653]
programme of road construction, and irrigation repair works and new
construction was undertaken.

When rain fell, it was again found necessary to issue loans to

7: Gt. Brit., Colonial Office G-3 (1949-50) 1951 MM1 Aden Hadhramaut MM2

CLIMATE

132 The maritime plains are damp and hot in the summer, and are subject to sandstorms and high winds. In the winter (October to the end of March) it is cool and sometimes cold at night and much less damp.

In the mountains, which vary in height between 1,500 and 8,000 feet, it is drier and cooler during the day and night ; at above 4,500 feet it can be very cold.

In the Wadi Hadramaut and the intervening tableland or "Jol," extremes of both heat and cold are encountered. The heat, in contrast to that of the coast, is dry, but more intense. The rainfall is small.

132 There is little rainfall in the littoral and maritime hills ; here cultiva-
312 tion is chiefly dependent on irrigation from water channels and courses.
In the highlands well irrigation is common and there is heavier rainfall, which is led down ravines and defiles into terraced fields.

GENERAL DESCRIPTION

133 The Western Aden Protectorate is divided into the littoral belt which varies between four and 40 miles in depth ; the maritime ranges about 1,000–2,000 feet above sea-level ; the intramontane plains over 3,000 feet high ; and the highland plateau which ranges from 5,000 to 8,000 feet high and falls away into the Ruba' al Khali (or Empty Quarter) with a mean altitude of 2,500 feet. The country between the littoral belt on the one hand and the intramontane plains and the plateau on the other is a tangle of mountains, ravines and valleys. Some of the valleys are very fertile. The plateau itself is broken up by numerous hills and mountains and is intersected with several deep valleys.

311 The greater part of the Eastern Aden Protectorate consists of desert and barren mountains intersected by wadis, some of which are fertile and cultivated. There are a number of comparatively large towns, notably Mukalla, the capital of the Qu'aiti State and principal seaport, and Sai'un, the capital of the Kathiri State.

Chapter 12: Administration

631 The Eastern Aden Protectorate comprises the Hadhramaut (consisting
648 of the Qu'aiti State of Shihr and Mukalla, and the Kathiri State of
Seiyun), the Mahri Sultanate of Qishn and Socotra, the Wahidi
649 Sultanates of Bir 'Ali and the Sheikhdoms of Irqa and Haura, all of
which have been for many years in protective treaty relations with His Majesty's Government. His Highness Sultan Sir Salih bin Ghalib al Qu'aiti, K.C.M.G., Sultan of Shihr and Mukalla, is the premier chief in the Eastern Aden Protectorate, and the Hadramaut is the most important and best organised of these areas. It is bounded on the west by the Wahidi Sultanates and on the east by the Mahri Sultanate.

648 The Mahri Sultanate of Qishn and Socotra is the most easterly
631 area in the Aden Protectorate, being bounded on the east by the

8:Gt. Brit., Colonial Office G-3 (1951-52)1954 MM1 Aden
Hadhramaut MM2

PART VI

Chapter 1: Geography and Climate

GEOGRAPHY

131 The Aden Protectorate which can be more conveniently described
648 administratively and geographically by dividing it into two areas, the Western and Eastern, has a total superficial area of about 112,000 square miles. It is bounded on the east by the western boundary of the Sultanate of Muscat and Oman, on the north and west by the Ruba' al Khali (or Empty Quarter) and the Kingdom of the Yemen (whose southern boundary was temporarily established by Article III of the Treaty of Sana'a of 11th February, 1934, by which His Majesty's Government and the Government of the Yemen agreed to maintain the *status quo* as on the date of the signature of the treaty), and on the south by the Gulf of Aden and the Indian Ocean. The Aden Protectorate seaboard starts at Husn Murad (opposite Perim) on the west, and runs for 740 miles eastwards to Ras Dhurbat Ali, where it meets the frontier of the Sultanate of Muscat and Oman.

133 The Western Protectorate is divided into the littoral belt which varies between four and 40 miles in depth; the maritime ranges about 1,000—2,000 feet above sea-level; the intramontane plains over 3,000 feet high; and the highland plateau which ranges from 5,000 to 8,000 feet high and falls away into the Ruba' al Khali (or Empty Quarter) with a mean altitude of 2,500 feet. The country between the littoral belt and the intramontane plains and the plateau is a tangle of mountains, ravines and valleys. Some of the valleys are very fertile. The plateau itself is broken up by numerous hills and mountains and is intersected with several deep valleys.

The greater part of the Eastern Protectorate consists of desert and barren mountains intersected by wadis, some of which are fertile and
361 cultivated. There are a number of comparatively large towns, notably Mukalla, the capital of the Qu'aiti State and principal seaport, and Sai'un, the capital of the Kathiri State.

CLIMATE

132 The maritime plains are damp and hot in the summer, and are subject to sandstorms and high winds. In the winter (October to the end of March) it is cool and sometimes cold at night and much less damp.

In the mountains, which vary in height between 1,500 and 8,000 feet, it is drier and cooler during the day and night; at above 4,500 feet it can be very cold.

In the Wadi Hadramaut and the intervening tableland or "Jol", extremes of both heat and cold are encountered. The heat, in contrast to that of the coast, is dry, but more intense. The rainfall is small.

ADEN MM1
HADHRAMAUT MM2

H 42 648 [635] are bound by protective treaties with Great Britain. Administratively, it is divided into two areas, the Western Aden Protectorate, covering roughly 45,000 square miles in the southwestern highlands; and the Eastern Aden Protectorate, which incorporates the remaining territory and the island of Socotra, about 150 miles from Cape Guardafui, the easternmost point in Africa.

H 133 The geography of the region is characterized by mountains and high plateaus which slope to a sandy plain along the coast and are intersected by deep and often fertile valleys. The topography of Western Aden Protectorate is particularly rugged. Four zones are differentiated: the littoral; the coastal hills reaching up to 2,000 feet in height; the inland plains, with slightly higher elevations; and the interior plateau, at an altitude of 5,000 to 8,000 feet. The dominant feature of the Eastern Aden Protectorate is the Wadi Hadhramaut. The valley, which is broad and well defined, parallels the coast for almost 200 miles before turning southeast toward the sea. It is hemmed in by massive plateaus, with an average elevation of 6,000 feet in the south and 3,500 feet in the north, which are terraced and dissected by numerous secondary wadies. The main valley lies over 100 miles inland, and is separated from the coast by a complex terrain of mountains, steppe and desert.

H 132 Few meteorologic observations have been recorded. Extreme heat, accompanied by high humidity, is encountered in the coastal region during the summer; slightly moderated temperatures at the time of the northeast monsoon, from October to April. A 132 The mean temperature in the Colony is estimated at 80° F.; 75° F. in the winter and 90° F. in the summer. The daily range is slight in the summer, but cool and sometimes cold nights are experienced during the winter months. The temperatures in the interior vary with the altitude and the season. Marked contrasts exist between the heat of the shut-in wadies and the cooler temperatures of the high plateaus. The rainfall is

p. 236(A)

30: Gt. Britain G-5 (ca. 1918) 1920 MJ1 Saudi Arabia

Hadhramaut MM2

631 which could be utilized by a force advancing into British territory from Yemen, or the converse. The main lines of communication
487 are three: (*a*) through the Dhāla valley, (*b*) through the Tiban valley, and (*c*) past Mafālis and down Wādi Ma'din, a tributary of the Wādi Darr. The area of the Aden Interior, thus considered, is about 19,000 sq. miles.

Physical Character

•133 The region may be divided into six clearly defined zones, roughly parallel with the coast and not greatly differing from those of Yemen:

(1) The littoral belt.
(2) The maritime ranges.
(3) The intramontane plains.
(4) The main watershed.
(5) The up-country plateau.
(6) The great inland desert.

(1) The littoral belt is a level, maritime plain, chiefly desert and often saline near the coast. Two important oases may be noted: (*a*) that of Lahej, in the 'Abdāli Sultanate, between Wādis Kebīr and Saghīr, bifurcations of the Tiban valley; (*b*) Abiyān, a large district of scattered villages and cultivation lying between Wādis Bana and Hasan. Each of these oases has an approximate area of 60 sq. miles, but that of Lahej is by far the richer of the two.

(2) The littoral belt, which varies in width from 40 miles to less than four, is backed by low ranges of maritime hills, black and metamorphic, which culminate here and there in upstanding and often twin peaks of 3,000 or more feet in altitude. Passes, by which caravan routes cross the crest, average 2,500 ft. The maritime scarps of the ranges are barren and almost waterless; but the inland slopes, which are far less abrupt, hold wooded water-courses and permanent wells.

(3) The series of broad plains, inland of the maritime hills, which average 2,000 ft. above sea-level, are of sterile aspect but have a small regular rainfall in the summer, which enables fairly large areas to be placed under cultivation.

(4) The main watershed rises almost sheer from the plains and in parts, especially at the eastern end, has the appearance of an unbroken wall, but really consists of several mountain ranges which overlap each other. The crests attain an average altitude of 7,000 ft. above sea-level. Passes, on caravan routes, seldom exceed 5,000 ft. in height. This main watershed is highest in the west where it merges into the Yemen highlands. It is usually known

30: Gt. Britain G-5 (ca. 1918) 1920 MJ1 Saudi Arabia

133

among the natives as the *Kaur*, or highland, with various local names attached, such as Kaur el-'Audillah, El-Od (or El-'Aud), Edth, &c. It is well watered, but the maritime scarps are comparatively sterile and much steeper than the internal slopes. Unlike the Yemen highlands, the Kaur is thinly populated by semi-nomadic, pastoral tribes, and is poorly cultivated.

(5) Inland of this ridge the ground gradually descends in a series of terraces to large well-watered plateaux lying at an average altitude of 5,000 ft., where are most of the mountain settlements and extensive cultivated tracts. The plateaux are intersected by many subsidiary ranges of foot-hills running down from the ridge, and they decline gradually towards the north and north-east, the fertile and broken terrain opening out by degrees into broad and comparatively sterile tracts, which merge into the rolling sands of the Ruba' el-Khāli.

(6) The great inland desert has a mean altitude of 3,500 ft. along its southern margin, while occasional isolated ranges, far out in the desert, probably rise to 5,000 ft.: this is as much as human knowledge can say at present about the Ruba' el-Khāli.

The innumerable wādis, deep and precipitous in their upper reaches in the plateaux but shallower and broader as they cross the plain, by which this region as a whole is intersected, run mostly in a southerly direction. As in other parts of South-West Arabia, all are dry during the greater part of the year, but water-courses come down in violent spate when heavy rain has fallen in the hills, and then some of the larger ones reach the sea. Of these wādis the most important (enumerating from west to east) are Tarbaha, Timnan, Am Shahar, Darr, the Tiban which bifurcates north of Lahej and waters that oasis with its two branches Wādi Kebīr and Wādi Saghīr, the Bana, some 40 miles east of Aden, which in time of flood cuts its way through the sand-bar at its mouth to the sea, Wādi Hasan, fed by Wādi Yerāmis, and Wādi Ahwar (Hūwar), fed by Wādis Jahr (Gahr) and Leikah. North of the Kaur the country is drained by Wādis Beihān, Khalla, Surum, Khaura, Na'mān (or Na'mah), Khatib, and 'Abdān, all of which have more or less direct northerly courses, and sooner or later merge into the unexplored Wādi Markhah which loses itself in the Sāfi (or (Ahqāf). The Tiban calls for special mention as, with its complex ramifications, it forms the main artery of communication with the Yemen. Of its innumerable branches, the 'Aqqān, Warazān, Sūdān, and Tisan (or Qaisān) on the r. bank, and Bilih and Tabaghain on the l., are the chief. The stream of the Tiban is perennial, though short waterless stretches of river-bed will be met with, during

30: Gt. Britain G-5 (ca. 1918) 1920 MJ1 Saudi Arabia
Hadhramaut MM21

133 the greater part of the year, in certain places. These interruptions are due to the entire volume of water—which in dry seasons is not very considerable—being led off into the cultivation and returned again lower down. It is said that the waters of the Tiban, like those of the Bana, occasionally reach the sea after abnormal floods. The Bana River runs continuously from May to October.

The coast-line generally is low and sandy and devoid of promontories or inlets of any size, except at Aden, where craterous promontories rise to about 1,700 ft. above sea-level, forming sheltered bays, and at a point some sixty miles west of Aden, where a spur of the Yemen highlands approaches the coast at Khōr 'Umeirah.

Climate

132 [164] 241 311 In the first zone—the littoral—the heat in general is excessive, but the climate is not unhealthy for those who can stand the fierce heat of the day, and the nights are cool. The cultivated oases and river-beds, however, which afford grateful shade by day, should be avoided as fever traps, and the Tiban valley and Lahej oasis in general have an ill name for malaria of a malignant type. The only rainfall is afforded by a few showers in mid-winter. Cultivation depends chiefly on irrigation from the wādi water-courses, and consists almost entirely of millet, *jowari*, and tall fodder crops such as *kirbi*.

In the second zone—the maritime hills—the rainfall is as in the first zone; but there is no opportunity for wādi irrigation, and in consequence scarcely any crops are raised. The air is stifling by day and damp at night.

In the third zone—the intramontane plains—the rainfall takes place during the summer in occasional thunderstorms. The crops are millet and maize, and they become more abundant and fertile as the main watershed is approached. The heat here, again, is very great.

In the fourth zone—the main watershed—there is a considerable rainfall during the summer months, and a bracing and fairly equable climate with sometimes a degree or so of frost at night. Cultivation is scanty, chiefly barley and a few light fodder crops.

In the fifth zone—the plateau—water lies within ten feet or so of the surface, and there is a good deal of irrigation from wells, besides the regular rainfall. This is small, but from October to March the region is liable to dense white fogs which fall after dark and lie thick to 9 a.m. They will wet one through in an hour, but are invaluable to the farmer as they alone keep the crops alive till

30: Gt. Britain G-5 (ca. 1918) 1920 MJ1 Saudi Arabia
Hadhramaut MM2

Physical Character

•133 Physically the Hadhramaut may be divided into four main horizontal belts: (*a*) the lowland belt of littoral flats and foot-hills; (*b*) a broad belt of downs or plateaux (*jāl*) diversified by a few outstanding peaks; (*c*) a belt of deep-cut wādis sloping north and north-eastward into a great main depression; and (*d*) a naked scarped ridge which skirts, and merges into, the great central sands.

(*a*) The coastal belt varies in width, rarely, however, extending much more than ten miles inland, and is an arid waste of plain and low sand-hills with a gentle rise towards the southern spurs of the plateau belt. The coastline itself, which runs in a generally east-north-easterly direction, is fairly regular, but has a number of projecting points with small intervening bays without deep indentations to form good natural harbours, and here and there longer stretches of unbroken line of low sand. The chief promontories are Ras el-Asīda, Ras el-Kelb, Ras Makalla, Ras Baghashwah, Ras Atāb, Ras Sharwein, and Ras Fartak.

(*b*) The plateau, which is calcareous in character and extremely arid, presents a more or less abrupt escarpment towards the sea and is, in fact, only a continuation of the great Yemen shelf or plateau and is penetrated in step-like stages by a number of rapidly ascending and burnt-up, arid, or sand-covered valleys. The crest line of the plateau lies generally some 30 miles from the coast and attains an average height of from 4,000–5,000 ft., the highest part being the Hāj Bāl Qabrein near the head of Wādi el-Aisar (or 'Aisār), one of the many tributaries of the main Wādi Hadhramaut. The surface of the plateau, which has a general slope towards the north and north-east, is comparatively uniform, with here and there a prominent peak. There are, however, very numerous shallow depressions where cultivation becomes possible, the water being supplied from artificial tanks that have been constructed to collect the surface water.

(*c*) The deeply sunk wādis, by which the plateau is intersected, have a generally north or north-easterly trend, until they lead into the main wādi, which makes an immense easterly to south-easterly curve of over 500 miles before it debouches at the coast. The wādis in parts have almost the character of canyons, so abrupt and precipitous are their sides, and they look much as if they had been cut out of the plateau 'like slices out of a cake'. The descents into them are exceedingly sudden, but in the wādis themselves there is very little slope. Like those of the Yemen, they are in great part ex-

30: Gt. Britain G-5 (ca. 1918) 1920 MJ1 Saudi Arabia

Hadhramaut MM21

tremely fertile, for though they have no visible perennial watercourses, water is very abundant in the subsoil throughout the system and is procurable almost everywhere by sinking wells; this is eminently the case in the main Hadhramaut wādi, or at least over a considerable part of its length, where vast reservoirs of water are available at little depths below the surface, at all times of the year, for the irrigation of comparatively large and continuous tracts of land. The last hundred miles or so of the main wādi are, however, desert, owing to the almost complete absorption of the water higher up for irrigation purposes; the oasis tracts are thus removed from direct contact with the sea. The chief tributary wādis, naming them from west to east, are the 'Irmah, Rashah, 'Amd, Dō'an, and 'Aisār, all of which join to form the Kesr; the 'Ain, Bin 'Ali, and 'Adam, all eventually leading into the main Hadhramaut Wādi. 133 ●

(*c*) The scarped belt, skirting the main wādi to the north, and penetrated in parts by shorter tributary wādis, is calcareous and arid, and to a certain extent screens the main depression from the formidable desert tract beyond, which, however, makes encroachments on this depression.

CLIMATE

The district as a whole is hot except on the elevated plateau. 132 The climate of the coastal tract is extremely hot and enervating (intolerably so in summer) owing largely to the aspect of the coast, which is almost due south, and to the elevated region by which it is backed; the heat is especially oppressive when, as not infrequently happens, there are no sea-breezes. Bent describes the air of the tableland as 'fresh and invigorating after the excessive heat of the valleys below', and he mentions Sujeila, at an altitude of 3,150 ft., as 'having excellent air that would make it a first-class sanatorium for Aden'. But this upland appears to be subject, at certain seasons, to a cold, penetrating wind, to cold and dewy nights, and to very great extremes of temperature.

Twice during the year the coastal districts, at all events, of the Hadhramaut receive their share of the rains brought by the monsoons, though probably in a less degree than the Yemen. But the regularity of the rains in the interior is not so certain, for when the Bents visited the Wādi Sirr in 1894 they were told by the inhabitants that they had had no rain for two years, and that they were sometimes without any for as much as three years at a time. Thunderstorms of a very sudden and violent nature are recorded by travellers, these being usually preceded by fierce heat and hot and violent

30: Gt. Britain G-5 (ca. 1918) 1920 MJ1 Saudi Arabia
Hadhramaut MM2

361 of Sheikh 'Othmān and small village of Hiswah on the north-east, at a radius roughly of ten miles from Aden town. The island of Socotra, in the Arabian Sea, passed under the protection of the British Government in virtue of a treaty concluded with the Sultan of Mahrah in 1886 (p. 205).

133 The peninsula of Aden proper is an irregular oval, 15 miles in circumference, with a diameter of from 3 to 5 miles, connected with the mainland by a neck of land about 1,350 yards wide, but at one place nearly covered at high spring tides. The causeway and aqueduct, however, are always above, although at some seasons only just above, water level. The peninsula consists of a huge crater walled round by precipices, the highest point being 1,775 feet above the sea; and rugged spurs, with valleys between, radiate from the centre. A great gap in the circumference of the crater has been rent on its eastern sea-face by some later volcanic disturbance. The town of Aden and part of the military cantonment lie within the crater, and consequently are surrounded on all sides by rocky hills. Lavas, spongy breccias, and tufas form the materials of this volcanic fortress. The natural vegetation is very scanty and resembles that of Arabia Petræa.

132 The average shade temperature of Aden is 87°—the mean monthly
range being from 75° in January to 98° in June, with occasional
variations up to or exceeding 102°. The lulls between the monsoon
periods, in May and September, are specially oppressive. The
[165] mortality among Europeans, although greatly increased by the sick
or dying from the passengers and crews of ships, amounts to only
[164] 7·2 per thousand. Aden, in fact, ranks as a rather healthy station
for troops, though on first arrival they are subject to sandfly-fever, and it is a well-ascertained fact that long residence impairs the faculties and undermines the constitution of Europeans. The climate during the north-east monsoon, or from October to April, is cool and pleasant, particularly in November, December, and January. During the remainder of the year (the period of the south-west monsoon), hot sandy winds, known as *Shamāl* (north), prevail within the crater, but on the western or Steamer Point side the breezes come directly off the sea and are fairly cool. The rainfall may be said to vary from ¼ inch to 8½ inches, with an irregular average of about 3 inches; the irregularity and smallness of the yearly rainfall is borne out by the fact that the tanks, since their restoration in 1856, have only been filled six times—in May 1866 and 1870, and September 1877, 1889, 1893, and 1897. The
164 Settlement is exceptionally free from infectious diseases and epidemics. The absence of vegetation, the dryness of the soil, and the